For accessibility assistance with this document, please contact the Sonoma County Department of Parks at (707) 565-2041 or through the California Relay Service (by dialing 711).

FINAL

CEQA INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

HOOD MOUNTAIN REGIONAL PARK AND OPEN SPACE PRESERVE LAWSON EXPANSION MASTER PLAN

SONOMA COUNTY, CALIFORNIA

Prepared for:

Sonoma County Regional Parks Department
2300 County Center Drive, Suite 120A
Santa Rosa, California 95403

Prepared by:

LSA
157 Park Place
Pt. Richmond, California 94801
510.236.6810

Project No. SOG1401A

LSA

May 2018

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MITIGATED NEGATIVE DECLARATION

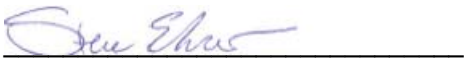
Project Name. Hood Mountain Regional Park and Open Space Preserve – Lawson Expansion Master Plan (Lawson Expansion Master Plan)

Project Location. The Lawson Expansion is located adjacent to Hood Mountain Regional Park and Open Space Preserve, east of the City of Santa Rosa in unincorporated Sonoma County, California. The project site includes two vacant parcels (Assessor Parcel Numbers (APN) 030-030-002 and 030-110-007) totaling 273 acres.

Project Description. Sonoma County Regional Parks (Regional Parks) proposes to adopt and implement a proposed Master Plan/Resource Management Plan (MP/RMP) for the 247 acre Lawson Expansion (project site) that has recently been added to the Hood Mountain Regional Park and Open Space Preserve (Hood Mountain). The Lawson Expansion encompasses approximately 247 acres of open space that includes grasslands, oak woodlands, mixed evergreen forest and chaparral. The diverse landscape and topography provides spectacular views and opportunities for a variety of visitor experiences. The planning process has studied the opportunities for the public to enjoy the site and to enhance and protect its unique and sensitive environment. This Initial Study evaluates the potential environmental effects of implementing the proposed draft MP/RMP.

Findings. It is hereby determined that, based on the information contained in the attached Initial Study, the project would not have a significant adverse effect on the environment.

Mitigation measures necessary to avoid the potentially significant effects on the environment are included in the attached Initial Study, which is hereby incorporated and fully made part of this Mitigated Negative Declaration. Sonoma County Regional Parks has hereby agreed to implement each of the identified mitigation measures, which would be adopted as part of the Mitigation Monitoring and Reporting Program.



8/22/17

Steve Ehret, Park Planning Manager
Sonoma County Regional Parks

Date

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TABLE OF CONTENTS

FIGURES

Tables

Appendices

INITIAL STUDY

PROJECT INFORMATION

Project title:

Hood Mountain Regional Park and Open Space Preserve – Lawson Expansion Master Plan (Lawson Expansion Master Plan)

Lead agency name and address:

Sonoma County Regional Parks
2300 County Center Drive, Suite 120A
Santa Rosa, California 95403

Contact person and phone number:

Ms. Karen Davis-Brown
Sonoma County Regional Parks
(707) 565-1359
Karen.Davis-Brown@sonoma-county.org

Project location:

The Lawson Expansion property is located adjacent to Hood Mountain Regional Park and Open Space Preserve, east of the City of Santa Rosa in unincorporated Sonoma County, California (Figure 1). The project site includes two vacant parcels (Assessor Parcel Numbers (APN) 030-030-002 and 030-110-007) totaling 247.3 acres (Figure 2).

Project sponsor's name and address:

Sonoma County Regional Parks
2300 County Center Drive, Suite 120A
Santa Rosa, California 95403

General plan designation:

RRD (Resources and Rural Development)

Zoning:

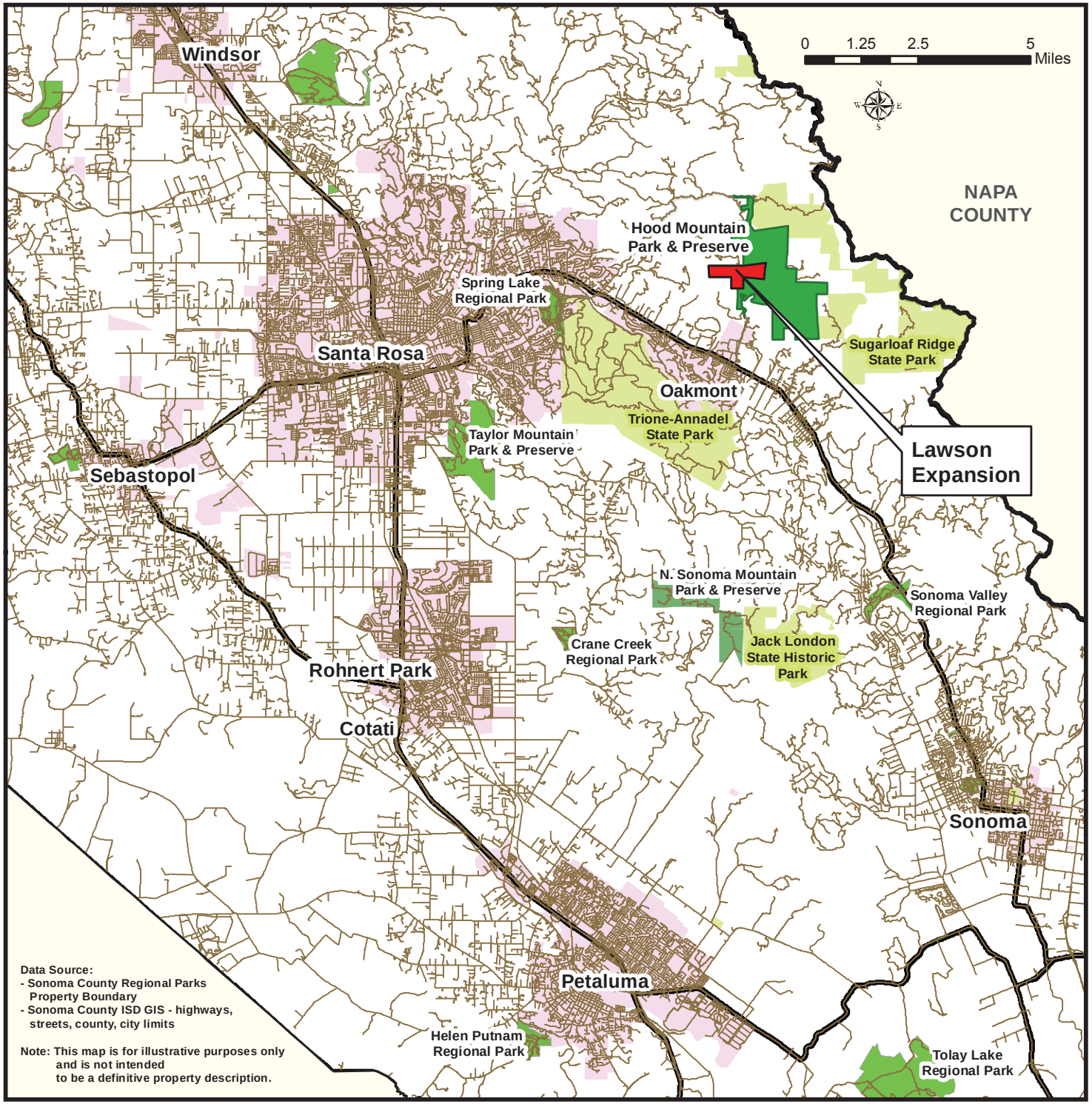
RRD B6 100 (Resources and Rural Development)

BH RC 50/50 (Biotic Habitat – Riparian Corridor Combining Zone

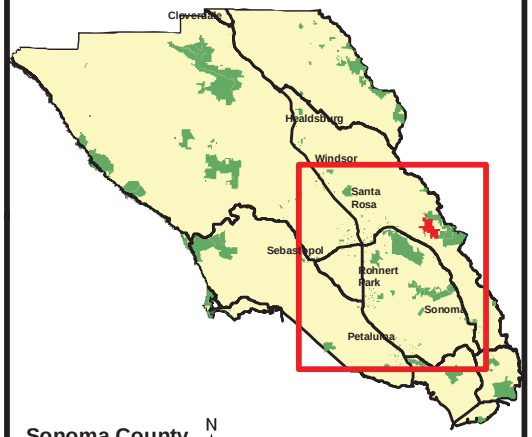
Hood Mountain Regional Park and Open Space Preserve Lawson Expansion

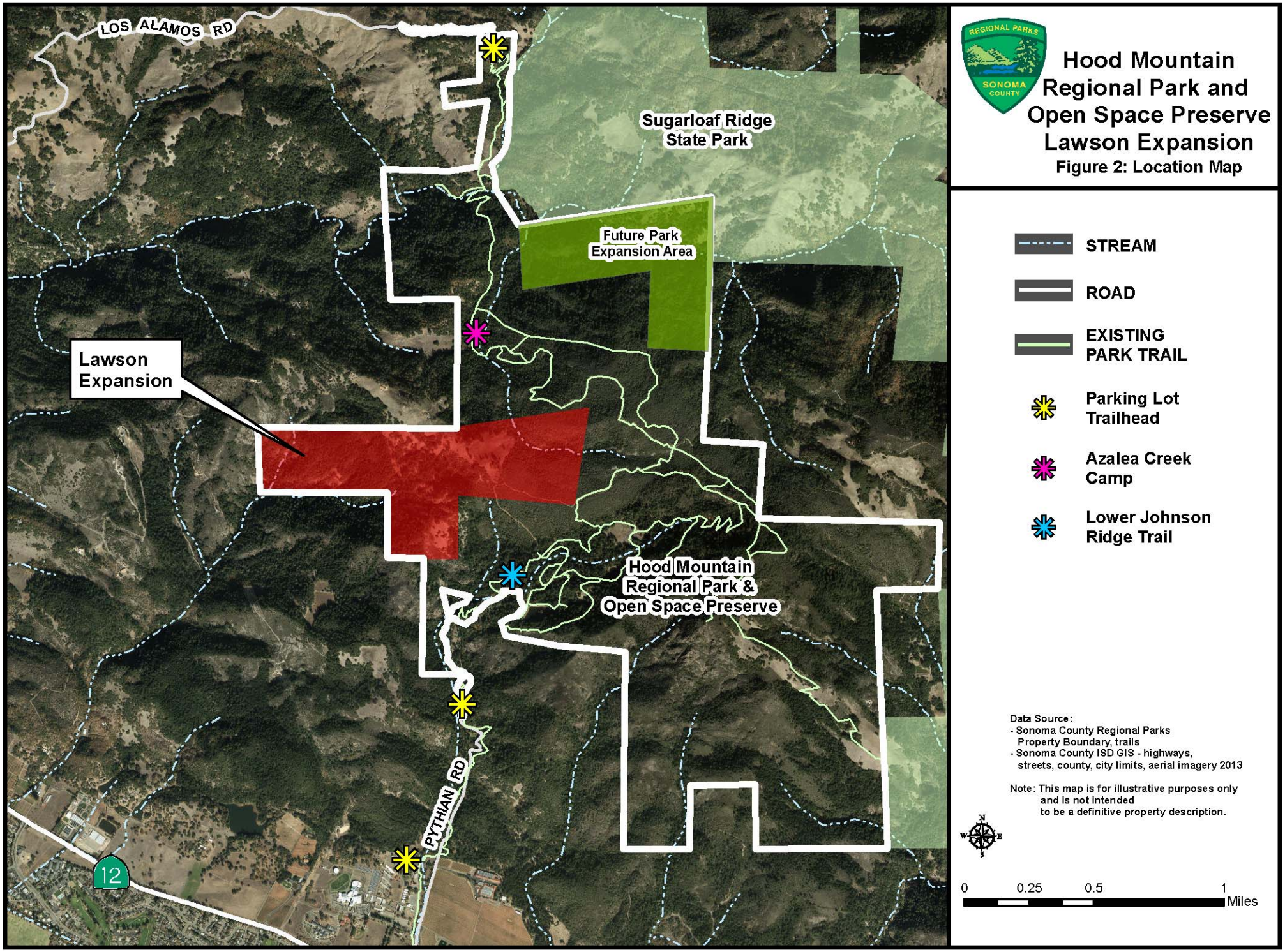
Figure 1: Regional Location Map

March 2017



Enlarged View to Left




LOS ALAMOS RD
Sugarloaf Ridge
State Park
Future Park
Expansion Area
Lawson
Expansion
Hood Mountain
Regional Park &
Open Space Preserve
PYTHIAN RD
12
REGIONAL PARKS
SONOMA
COUNTY
Hood Mountain
Regional Park and
Open Space Preserve
Lawson Expansion
Figure 2: Location Map
STREAM
ROAD
EXISTING
PARK TRAIL
Parking Lot
Trailhead
Azalea Creek
Camp
Lower Johnson
Ridge Trail
Data Source:
- Sonoma County Regional Parks
Property Boundary, trails
- Sonoma County ISD GIS - highways,
streets, county, city limits, aerial imagery 2013
Note: This map is for illustrative purposes only
and is not intended
to be a definitive property description.
N
W
E
S
0
0.25
0.5
1
Miles

Description of project

Sonoma County Regional Parks (Regional Parks) proposes to adopt and implement a proposed Master Plan/Resource Management Plan (MP/RMP) for the 247-acre Lawson Expansion (project site) that has recently been added to the Hood Mountain Regional Park and Open Space Preserve (Hood Mountain). The Lawson Expansion encompasses approximately 247 acres of open space that includes grasslands, oak woodlands, mixed evergreen forest and chaparral. The diverse landscape and topography provides spectacular views and opportunities for a variety of visitor experiences. The planning process has studied the opportunities for the public to enjoy the site and to enhance and protect its unique and sensitive environment. This Initial Study evaluates the potential environmental effects of implementing the proposed draft MP/RMP.

Project Background. The Sonoma County Agricultural Preservation & Open Space District (District) acquired the 247-acre Lawson Expansion on October 7, 2005, for open space preservation and low-intensity public outdoor recreational use as an addition to the adjacent Hood Mountain Regional Park and Open Space Preserve. Acquisition of the Lawson Expansion protected a prominent ridgeline that is very visible from the Highway 12 scenic corridor. The acquisition preserves native plant and animal habitats, and was intended to expand access opportunities and provide scenic vistas for park visitors.

The District currently holds a conservation easement over the adjacent Johnson property, which the District purchased in 2003 and transferred to the County as an addition to Hood Mountain.

In June 2014, the District conveyed its fee interest in the Lawson Expansion to Regional Parks in exchange for a Conservation Easement and a Recreation Covenant by which the County agrees to operate the project site in perpetuity for low-intensity public outdoor recreation.

On October 8, 2017, wildland fires started in Sonoma County that destroyed homes and businesses, and killed more than 40 people. The fires burned for many days during which time tens of thousands of people across the County were evacuated or displaced from their homes. The open space area provided by Regional Parks at Lawson Peak was integral in the control of the Nuns Fire and the protection of more populated areas by allowing firefighters to create a large fire break that prevented the fire from moving north and west into the rest of the park and onto neighboring lands, Rincon Valley and Napa County.

The Nuns fire affected Hood Mountain Regional Park and Open Space Preserve, coming into the park from the south. A later fire that began on Pythian Road joined the Nuns Fire within Hood Mountain. The Nuns Fire burned approximately 50 percent of the Hood Mountain Regional Park and Open Space Preserve. The fire that began on Pythian Road affected approximately 1/3 of the Lawson Expansion, leaving a patchwork of burned areas in the portion of the project site located to the west of and below the existing structures.

Suppression tactics were utilized on the Lawson Expansion to create a safety zone on Lawson Peak. Approximately 5 acres of grasslands were cleared and back burn techniques[1] were used around the existing structures to create this safety zone. A single track dozer line (approximately 2,300 linear feet) along the ridgeline was cleared for fire suppression and hand lines were cut around the safety zone.

Following the fires, cleared grassland areas were seeded and covered with straw to repair suppression damage, and in spring 2018, these dozed areas are re-covered in grasslands. Along the single-track dozer line, fire crews pulled cut vegetation back onto the disturbed dozer line. To repair the fire suppression hand lines, checkdams were installed on steep slopes and the entire line was seeded and covered with straw.

Trees and understory burned throughout the Lawson Expansion, especially on the ridgeline in the southern area of the project site. Burned trees are still standing. Hazard trees along the existing access road/trail have been felled for safety. Regional Parks will continue to monitor the property for hazards and/or erosion issues that may arise. However, except for road and trail corridors, Regional Parks intends to let the land recuperate through natural processes. Vegetation rejuvenation has already begun as of spring 2018.

The MP/RMP includes goals and policies for protecting and preserving the site's resources and for implementing proposed improvements to enhance recreational opportunities for the public. The MP/RMP also includes monitoring to ensure management strategies are perpetuating the site's important natural, cultural, scenic and recreation values. No change to trail alignments, camping, or other proposed improvements are required due to the fires or fire suppression/restoration activities.

Planning Process. As part of the process for creating the MP/RMP for the Lawson Expansion, a series of community workshops provided a means for communities and interested parties surrounding the expansion area to share their thoughts and to shape the management plan and Lawson Expansion. The workshops were intended as forums to engage members of the community regarding key discussion points pertaining to the Lawson Expansion. Public input assisted Regional Parks in determining the optimum balance between all of the different planning considerations. The workshop process enabled various members of the community to be involved, express their concerns, identify issues and opportunities, evaluate various recreation options and shape the preferred alternative.

Project Site. The Lawson Expansion is located adjacent to Hood Mountain in unincorporated Sonoma County and consists of Assessor Parcel Numbers (APNs) 030-030-002 and 030-110-007. The project site is located east of the City of Santa Rosa in the western foothills of the Mayacama Mountain Range. Hood Mountain can be accessed from

[1] Back burn is a method used to fight fires, in which an area up to a half-mile wide in the path of the fire is scorched by fire fighters in a controlled manner. This scorched area acts as a divide between the oncoming fire and adjacent areas.

the south via Pythian Road, north of State Highway 12 and from the north via Los Alamos Road. The interior of the project site can be accessed by the existing Lawson Road/Trail and a service road.

Project Purpose. The purpose of the MP/RMP is to guide the development of the Lawson Expansion and to identify the best way to manage and protect the site's resources while balancing the needs of the community for safe recreational and educational opportunities. As identified during the public outreach process, the goals of the project are to:

- Provide accessible facilities and trails for a variety of users and user abilities.
- Develop facilities sensitive to the unique environment.
- Develop a Master Plan that provides a range of recreational opportunities, balances recreation with natural resource protection, protects unique natural and cultural resources; and encourages public education and interpretation.
- Develop a Resource Management Plan.

Project Objectives. The MP/RMP includes objectives and strategies that are intended to implement the vision and mission of Regional Parks. A compendium of all MP/RMP strategies is contained in Appendix A of this Initial Study for reference. MP/RMP objectives are listed below.

Natural Resources

BIO-1 Maintain populations of native plants and wildlife with special emphasis on management of locally uncommon, sensitive, federal and/or State threatened or endangered species and special-status vegetation alliances.

BIO-2 Avoid impacts to jurisdictional waters

BIO-3 Implement monitoring programs designed to identify ecosystem threats (e.g., invasive species, recreation use, and erosion) and use monitoring data to guide management of the area.

Cultural Resources

CULT-1 Protect and preserve cultural resources in the project site.

CULT-2 Educate Park Users as to the Significance of Resources in the Project Site.

CULT-3 Work Cooperatively and Collaboratively with Native American Tribes that consider the Lawson Expansion part of their tribal territory.

Visual Resources

VISUAL-1: Protect and enhance views and distinctive landscape features that contribute to the setting, character and visitor experience of the area, including the Highway 12 scenic corridor.

Public Access and Recreation

REC-1 Provide a trail system that balances resource protection with high quality public access, maximizing, to the extent feasible, sensitive resource protection. Design trails in accordance with appropriate trail standards, including the California Department of Parks and Recreation's Trails Handbook (1991) and Accessibility Guidelines (2015) and the California Department of Conservation and Recreation's Trail Guidelines and Best Practices Manual (2010). See below for Trail Standards RCE-1.1 through REC-4.3.

REC-2 Create a trail system that provides a broad public benefit by accommodating diverse uses and user abilities.

REC-3 Enforce protection of the varied resources and promote an enjoyable and safe environment for visitors.

REC-4: Accommodate parking, access points, trail amenities, and other recreational facilities that maintain the natural character of the land, enhance resource protection and contribute to the enjoyment of open space.

Interpretation/Education

INTERP-1 Provide relevant interpretive and education programs that increases the public's understanding and appreciation of the significant natural and cultural resources of the project area.

INTERP-2: Provide a trail system that promotes and enhances public enjoyment and appreciation of the natural, cultural and scenic resources.

INTERP-3: Maintain strong community relations to ensure a positive visitor experience with minimal adverse impacts on neighbors.

Facility Maintenance

MAINT-1 Maintain facilities to ensure that resource values are maintained and that management activities are supported.

MAINT-2 Remove litter, trash and debris that may attract or injure wildlife and reduce the aesthetic values of the project area.

MAINT-3 Patrol public use of the Lawson Expansion to ensure compliance with rules and regulations and to assess level of use.

Proposed Improvements. The conceptual development plan for the Lawson Expansion contains a number of proposed improvements. These improvements include:

Access

The Lawson Expansion can be accessed from the south via Pythian Road, north of State Highway 12. Two parking lots for the trailhead are provided on Pythian Road connecting to existing Hood Mountain trails. The project site can also be accessed from the north via Los Alamos Road parking lot and trailhead. The existing Lawson Expansion service road will continue to be maintained as a service road for Park Staff vehicles and as an access road/driveway for private in-holding property owners consistent with the conditions of the road easement. No public vehicles or recreational motorized vehicles are allowed within Hood Mountain including the Lawson Expansion.

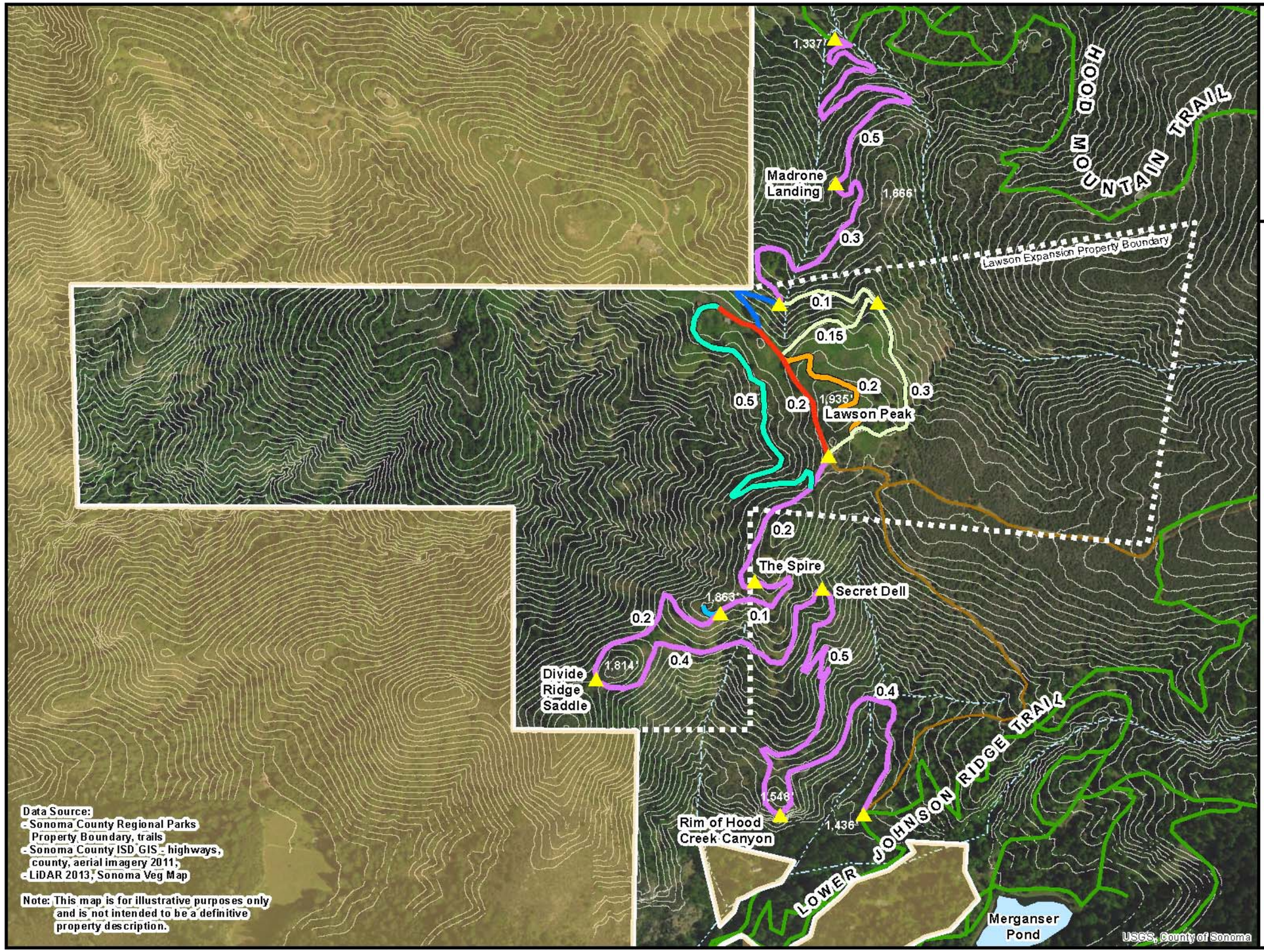
Trails

Trails are designed to accommodate a variety of users with varying interests and abilities. A multi-use trail may be used by all park user types including: hikers, mountain cyclists, and equestrians. Hiker-only trails may not be used by mountain cyclists and equestrians providing hikers more solitude and separation from higher traffic trails.

A total of 4.2 miles of unpaved multi-use and hiker-only trails are proposed on the Lawson property (Figure 3). The trails would be designed to follow the contours of the topography and connect to existing trails in the Hood Mountain Regional Park and Open Space Preserve. In addition, the trails would occur on existing road/trail alignments, where feasible. The trails would be designed to comply with the Americans with Disabilities Act (ADA)[2] to the greatest extent feasible. The ADA Guidelines establish accessibility standards for developed areas, and include trail standards to provide the highest level of access to the natural environment to persons with disabilities, without causing damage to the natural and cultural resources of a site. Refer to Table 1 for the trail name, trail length, and trail type for trails proposed on the Lawson property.

[2] The Americans with Disabilities Act of 1990 (ADA) prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, State and local government services, public accommodations, commercial facilities, and transportation.

Hood Mountain Regional Park and Open Space Preserve
Lawson Expansion
Figure 3: TRAIL PLAN



- STREAM
- SERVICE RD
- EX. PARK TRAILS
- WILD LILAC MULTI-USE TRAIL - 2.5 mi
- LAWSON CAMP MULTI-USE TRAIL - 0.2 mi
- LAWSON PEAK HIKER ONLY TRAIL - 0.2 mi
- LAWSON SPRINGS MULTI-USE TRAIL - 0.1 mi
- LAWSON CAMP LOOP HIKER ONLY TRAIL - 0.5
- WILD LILAC HIKER ONLY TRAIL - 0.55 mi
- SPIRE POINT HIKER ONLY TRAIL - 300 ft
- PRIVATE - NOT PARKLAND

20' Contour

0 400 800 1,600 Feet

Data Source:
- Sonoma County Regional Parks Property Boundary, trails
- Sonoma County ISD GIS - highways, county, aerial imagery 2011,
- LiDAR 2013, Sonoma Veg Map

Note: This map is for illustrative purposes only and is not intended to be a definitive property description.

Table 1: Proposed Multi-Use and Hiker-Only Trails on the Lawson Property

Trail Name	Trail Length (miles [mi])	Trail Type
Wild Lilac Trail	2.5	Multi-use
Lawson Camp Trail	0.2	Multi-use
Lawson Peak Trail	0.2	Hiker only
Lawson Springs Trail	0.1	Multi-use
Lawson Camp Loop Trail	0.5	Hiker only
Wild Lilac Trail	0.55	Hiker only
Spire Point Trail	0.06 (300 feet)	Hiker Only
TOTAL	**4.2**	

Source: Sonoma County Regional Parks. 2016. Community Workshop #2.

A majority of the trails would be multi-use trails designed for concurrent use by hikers, bikers, and equestrians. However, situations exist for which multi-use trails are not desirable or practical. Hiker only trails provide users with a separation from gathering areas (i.e. Lawson Camp), and an opportunity for peaceful interaction with the land, and vistas and camps with limited space hiker-only access is a more appropriate use for minimizing user conflict. In these cases, a hitching post is provided to secure horses away from these areas. Approximately one-fifth of the trails would be hiker-only trails.

The trails are split into three segments from north to south: Azalea Creek, Center, and Lower Johnson Ridge. The Azalea Creek trail segment would connect the Lawson property to the Azalea Creek Campground to the north (Figure 4). This trail segment would be adjacent to and east of Azalea Creek, avoid chaparral, and include the Madrone Landing. The Center trail segment would include the center facilities (i.e., campsites, restroom, and horse hitch) and preserve a historical site. Lawson Peak is located within this trail segment (Figure 5). The Lower Johnson trail segment would connect the Lawson property to existing park trails in the south. Trails in this segment would allow access to several scenic resources and vistas, including the Spire, Spire Point, and the rim of Hood Creek Canyon (Figure 6).

In addition, as shown in Figures 4-6, approximately 2 miles of the existing Lawson road/trail will not be utilized. Additionally further support of decommissioning will be accomplished by covering the trails with leaf litter and blocking them with physical barriers, and/or by posting signage and delivering citations, as necessary, to discontinue public access.

Camping

A total of four “environmental” campsites would be provided on the Lawson property (Figure 7). Three environmental campsites would be located off of the Lawson Camp Loop trail, in close proximity to the proposed two-room bunkhouse and associated facilities, including a pump-out restroom, and backcountry horse hitching post. The fourth environmental campsite would be located near Lawson’s Peak, off of the Lawson Peak Trail. Campsites would be primitive, hike-in sites with a picnic table, bear-resistant food locker and space for tent placement. All four campsites would be served by the pump-out restroom. Campfires would be prohibited. Dogs would be allowed at campsites provided they are accompanied by a human at all times and on a lead no longer than 6 feet. All pet waste must be picked up by owner and disposed of in a waste receptacle or packed out. The sites near each other could be rented for small group use and would include facilities for equestrian camping (e.g.,

Hood Mountain Regional Park and Open Space Preserve Lawson Expansion

Figure 4: Trail Map (Azalea Creek)

- STREAM
- EXISTING PARK TRAILS
- EXISTING LAWSON ROAD/TRAIL DECOMMISSIONED
- WILD LILAC MULTI-USE TRAIL i
- WILD LILAC HIKER ONLY TRAIL
- LAWSON CAMP LOOP HIKER ONLY TRAIL
- LAWSON CAMP MULTI-USE TRAIL
- LAWSON SPRINGS MULTI-USE TRAIL
- LAWSON PEAK HIKER ONLY TRAIL
- PROPOSED TRAIL ON EXISTING ALIGNMENT
- TRAIL INTERSECTION
- VIEW
- WATER SOURCE
- RESIDENCE
- AVOID CHAPARRAL
- MADRONE LANDING

Lawson Expansion Property Boundary

20' Contour

0 150 300 600 Feet

Data Source:
- Sonoma County Regional Parks Property Boundary, trails
- Sonoma County ISD GIS - highways, county, aerial imagery 2011,
- LiDAR 2013, Sonoma Veg Map

Note: This map is for illustrative purposes only and is not intended to be a definitive property description.

Hood Mountain Regional Park and Open Space Preserve Lawson Expansion

Figure 5: Trail Map (Center)

Private - Not Parkland

Existing Hood Mountain Park & Preserve Boundary

Lawson Expansion Property Boundary

- STREAM
- SERVICE RD
- EXISTING LAWSON ROAD/TRAIL DECOMMISSIONED
- WILD LILAC MULTI-USE TRAIL
- WILD LILAC HIKER ONLY TRAIL
- LAWSON CAMP LOOP HIKER ONLY TRAIL
- LAWSON CAMP MULTI-USE TRAIL
- LAWSON SPRINGS MULTI-USE TRAIL
- LAWSON PEAK HIKER ONLY TRAIL
- PROPOSED TRAIL ON EXISTING ALIGNMENT
- TRAIL INTERSECTION
- VIEW
- WATER SOURCE
- RESIDENCE
- HISTORICAL
- LAWSON PEAK
- LOOP TRAIL

Data Source:
- Sonoma County Regional Parks Property Boundary, trails
- Sonoma County ISD GIS - highways, county, aerial imagery 2011,
- LiDAR 2013, Sonoma Veg Map

Note: This map is for illustrative purposes only and is not intended to be a definitive property description.

20' Contour

0 150 300 600 Feet

USGS, County of Sonoma

Hood Mountain Regional Park and Open Space Preserve Lawson Expansion

Figure 6: Trail Map
(Lower Johnson)

Lawson Expansion Property Boundary

Existing Hood Mountain Park & Preserve Boundary

Private - Not Parkland

Data Source:
- Sonoma County Regional Parks Property Boundary, trails
- Sonoma County ISD GIS - highways, county, aerial imagery 2011,
- LiDAR 2013, Sonoma Veg Map

Note: This map is for illustrative purposes only and is not intended to be a definitive property description.

20' Contour

0 175 350 700 Feet

USGS, County of Sonoma

- STREAM
- SERVICE RD
- EXISTING PARK TRAILS
- EXISTING LAWSON ROAD/TRAIL DECOMMISSIONED
- WILD LILAC MULTI-USE TRAIL
- WILD LILAC HIKER ONLY TRAIL
- LAWSON CAMP LOOP HIKER ONLY TRAIL
- LAWSON CAMP MULTI-USE TRAIL
- PROPOSED TRAIL ON EXISTING ALIGNMENT
- TRAIL INTERSECTION
- VIEW
- SECRET DELL
- THE SPIRE
- SPIRE POINT
- RIM OF HOOD CREEK CANYON
- DRAINAGE XING
- LOOP TRAIL

Hood Mountain Regional Park and Open Space Preserve Lawson Expansion

Figure 7: Facilities Development Map

Private - Not Parkland

Existing Hood Mountain Park & Preserve Boundary

Lawson Expansion Property Boundary

- STREAM
- SERVICE RD
- WILD LILAC MULTI-USE TRAIL
- LAWSON CAMP MULTI-USE TRAIL
- LAWSON PEAK HIKER ONLY TRAIL
- LAWSON SPRINGS MULTI-USE TRAIL
- LAWSON CAMP LOOP HIKER ONLY TRAIL
- WILD LILAC SPUR HIKER ONLY TRAIL
- SPIRE POINT HIKER ONLY TRAIL
- RESTROOM PUMP-OUT
- SINGLE FAMILY CAMPSITE
- TWO ROOM BUNK HOUSE WITH COMMUNAL FRUGAL KITCHEN FACILITIES
- BACKCOUNTRY HORSE - TROUGH, HIGHLINE, HITCHING POST
- INFORMAL PICNIC AREA
- INTERPRETIVE SIGNAGE

Data Source:
- Sonoma County Regional Parks Property Boundary, trails
- Sonoma County ISD GIS - highways, county, aerial imagery 2011,
- LiDAR 2013, Sonoma Veg Map

Note: This map is for illustrative purposes only and is not intended to be a definitive property description.

20' Contour

0 80 160 320 Feet

trough, highline, hitching post). Prior to construction, District approvals may be required for certain structures and improvements associated with camping improvements.

The campsites would be primarily screened with existing vegetation. A native vegetation screen would be planted to the north of the campsites to block views of the campsites from the trail and provide screening for the adjacent private landowner.

The proposed bunkhouse and associated facilities would be located in the same location as the existing barn and residence. The existing barn would be removed to provide space for the backcountry horse trough, highline, and hitching post. The existing residence may be modified or demolished and rebuilt within the same footprint into a two-room bunkhouse with bunk beds and primitive, communal kitchen facilities. The bunkhouse would not have electricity, gas or running potable water, but motion sensor, dark-sky association compliant lighting at the porch and/or restroom may be installed for safety and security.

Picnic Areas

Informal picnic areas consist of a level area with one or several picnic tables. Picnic sites would be provided for eating, resting, and enjoying views. Picnickers would be required to pack out what they pack in. Because of the long distance from the park entrance to areas suitable for picnicking, no group picnic areas are proposed. The informal picnic sites are located in areas with scenic views and where use is expected to be concentrated, including near Lawson's Peak off of Wild Lilac trail and the Wild Lilac Spur trail (Figure 7).

Fencing and Park Boundary Markers

Over one-mile of sheep fencing has been removed by park staff and volunteers since acquisition. The remaining remnant fencing will be removed along the interior of the project site (Figure 8). Much of the western boundary of the project site is not fenced and is characterized by steep terrain and dense vegetation. Park property boundary markers would be installed where feasible along the western property line to delineate the park property to minimize trespass issues. Public access is not proposed in the westernmost portion of the Lawson Expansion where the terrain is most rugged. Any additional boundary fencing deemed necessary in the future must be constructed to allow visibility and to not impede wildlife movement, per current standards for wildlife-friendly fencing.

Operational and Interpretive Signage

Operational signs provide information regarding park rules and regulations, including park hours, prohibited activities (e.g., fires, motorized vehicles), and other regulatory and public safety information. Regional Parks has a sign program for the operational signs for all of its facilities. The signs are installed on 4-inch by 4-inch square wood posts and are located at the access points to the park or, where needed, to regulate public use of the site. The Lawson Expansion would be accessed via existing trailheads/parking areas on Pythian Road and Los Alamos Road. Operational signs are already provided at these locations. If needed, an operational sign, trail map and/or display case may be posted at Lawson's Camp in the vicinity of the proposed bunkhouse.

Hood Mountain Regional Park and Open Space Preserve Lawson Expansion

Figure 8: Land Management Map

HOOD MOUNTAIN TRAIL

Lawson Expansion Property Boundary

LOWER JOHNSON RIDGE TRAIL

Merganser Pond

USGS, County of Sonoma

Data Source:
- Sonoma County Regional Parks Property Boundary, trails
- Sonoma County ISD GIS - highways, county, aerial imagery 2011,
- LiDAR 2013, Sonoma Veg Map

Note: This map is for illustrative purposes only and is not intended to be a definitive property description.

- STREAM
- SERVICE RD
- EX. PARK TRAILS
- LAWSON CAMP MULTI-USE TRAIL
- LAWSON PEAK HIKER ONLY TRAIL
- WILD LILAC MULTI-USE TRAIL
- LAWSON SPRINGS MULTI-USE TRAIL
- LAWSON CAMP LOOP HIKER ONLY TRAIL
- WILD LILAC HIKER ONLY TRAIL
- SPIRE POINT HIKER ONLY TRAIL
- PRIVATE - NOT PARKLAND
- DECOMMISSION TRAIL
- BOUNDARY MARKERS *WHERE FEASIBLE
- REMOVE REMNANT FENCING
- REMOVE REMNANT DEBRIS
- NATIVE VEGETATION PLAINTING ON DECOMMISSIONED ROAD
- NATIVE VEGETATION SCREEN PLANTING
- NO RECREATIONAL DEVELOPMENT

0 400 800 1,600 Feet

Interpretive displays provide more specific information on biotic, cultural, geologic, or other resources and features found within the park. Interpretive displays shall be consistent with the terms of the Conservation Easement, namely, no greater than two (2) square feet in size and mounted either on a steel frame or wood posts. The footings for these displays are concrete or direct burial depending upon site-specific soil conditions. An interpretive sign may be installed at Lawson's Peak. Additional interpretive displays may be installed at other points of interest, as determined by Regional Parks.

In addition, directional and/or distance signs would be provided at trailheads and key trail intersections to provide information on trail distances, appropriate trail use and restrictions.

Surrounding land uses and setting:

The Lawson Expansion consists of approximately 247 acres of land between Hood Mountain on the east and Buzzard Peak on the west. The terrain is steeply- to moderately-sloped with interspersed ridge areas of relatively gentle terrain. Several unnamed, seasonal streams drain the project area.

The Biological Resources Report (KCB 2010) identified four broad vegetation types on the project site; grassland, oak woodlands, mixed evergreen forest, and chaparral. Within these vegetation types, the report identified 19 vegetation alliances based on Sawyer et al. (2009), but these alliances were not mapped.

The Lawson Expansion is surrounded to the north, east, and south by undeveloped mountainous land. Hood Mountain borders the project site to the east, southeast and northeast. Private land borders the project site to the north and west. Residential uses within the City of Santa Rosa are located further west and south of the project site and Sugar Loaf State Park is located further north and east beyond Hood Mountain. The development of Oakmont Village and various wineries/vineyards are located to the south along State Highway 12.

Other public agencies with approval authority:

- U.S. Army Corps of Engineers (Section 404 of the Clean Water Act)
- California Department of Fish and Wildlife (Streambed Alteration Agreement)
- Regional Water Quality Control Board (Water Quality Certification or Waste Discharge Requirements)
- State Water Resources Control Board (National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity)
- This project is exempt from a grading/stormwater permit from PRMD per the Sonoma County Municipal Cod, Chapter 11 – Grading Ordinance, Section 11.04.010.C.12, which reads "Public projects. Grading for public projects on public property undertaken by or on behalf of the county or a local agency governed by the board of supervisors."

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" or "Less than Significant with Mitigation Incorporated" as indicated by the checklist on the following pages.

	Aesthetics		Land Use/Planning
	Agricultural & Forest Resources		Mineral Resources
X	Air Quality		Noise
X	Biological Resources		Population/Housing
X	Cultural Resources		Public Services
X	Geology/Soils	**X**	Recreation
	Greenhouse Gas Emissions		Transportation/Traffic
X	Hazards & Hazardous Materials		Utilities/Service Systems
	Hydrology/Water Quality	**X**	Mandatory Findings of Significance

Determination. (To be completed by the Lead Agency.)

On the basis of this initial evaluation:

I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

X I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

8/22/17

Steve Ehret, Park Planning Manager
Sonoma County Regional Parks

Date

EVALUATION OF ENVIRONMENTAL IMPACTS

This section identifies the environmental impacts of this project by answering questions from Appendix G of the CEQA Guidelines, the Environmental Checklist Form. The environmental issues evaluated in this chapter include:

Aesthetics	Land Use and Planning
Agricultural & Forest Resources	Mineral Resources
Air Quality	Noise
Biological Resources	Population and Housing
Cultural Resources	Public Services
Geology/Soils	Recreation
Greenhouse Gas Emissions	Transportation/Traffic
Hazards and Hazardous Materials	Utilities and Service Systems
Hydrology and Water Quality	Mandatory Findings of Significance

All analyses take into account the entire action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts. Impacts are categorized as follows:

Potentially Significant Impact is appropriate if there is substantial evidence that an effect is significant, or where the established threshold has been exceeded. If there are one or more “Potentially Significant Impact” entries when the determination is made, an Environmental Impact Report (EIR) may be required.

Less Than Significant with Mitigation Incorporated applies where the incorporation of mitigation measures would reduce an effect from Potentially Significant Impact to a Less Than Significant Impact. Mitigation measures are prescribed to reduce the effect to a less than significant level.

Less Than Significant applies when the project will affect or is affected by the environment, but based on sources cited in the report, the impact will not have an adverse effect. For the purpose of this report, beneficial impacts are also identified as less than significant. The benefit is identified in the discussion of impacts, which follows each checklist category.

A No Impact answer is adequately supported if referenced information sources show that the impact simply does not apply to projects like the one involved. A No Impact Answer is explained where it is based on project-specific factors as well as general standards.

I. AESTHETICS

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?			X	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?			X	
c) Substantially degrade the existing visual character or quality of the site and its surroundings?			X	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			X	

Affected Environment

The project site is located in unincorporated Sonoma County, within the Mayacama Mountain Range. The project site is surrounded by undeveloped mountainous land to the north, east, and south. Residential uses within the City of Santa Rosa are located to the west. The project site is undeveloped and features a prominent ridgeline with stunning views of the San Pablo and San Francisco Bays and the surrounding Sonoma/Mayacama Mountain Ranges.

The project site consists of areas with steep and moderate slopes interspersed with areas that are relatively flat. Vegetation onsite includes oak woodland, grasslands, mixed evergreen forest, riparian habitat, and chaparral/Sargent cypress woodland. Two existing structures, an old residence and a dilapidated barn, are located within the center portion of the project site. An existing unpaved road/trail provides access to all areas of the property. Three debris piles are located at the northern boundary within the center portion of the project site.

The fires that occurred in October 2017 altered the visual landscape of the project site. Some of the green vegetation was blackened and burned, especially on the ridgeline in the southern area of the project site. Grassland areas on Lawson Peak were cleared and re-seeded, but are currently recovering. Additionally, some of the hazard trees along the existing access road/trail have been removed for safety. However, scenic vistas to and from the project site remain and the site retains its largely undeveloped, natural character.

Surface waters within the project area include Azalea Creek, which flows through the northeast portion of the project site and two unnamed streams which flow through the western portion of the project site.

Discussion

a) *Have a substantial adverse effect on a scenic vista?*

Less Than Significant Impact. According to Figure OSRC-1, Scenic Resource Areas in the Sonoma County General Plan 2020 (2008), the project site is adjacent to the east of the Sonoma Valley/Mayacama Mountains Scenic Landscape Unit (SLU). The goal of this overlay designation, as stated in the General Plan OSRC-2, is to "retain the largely open, scenic character of important SLUs." The project site provides stunning views of the San Pablo and San Francisco Bays and the surrounding mountain ranges. One of the primary goals of the Master Plan is to preserve the scenic vistas of the property. Development of the trails, campsites, informal picnic areas, overnight cabin, and limited infrastructure such as restrooms and signage would be limited to the footprints outlined in the Master Plan. Proposed improvements would not include any structures taller than 30 feet (maximum one-story) or landscaping that would reduce, obstruct, or degrade scenic vistas. Therefore, the proposed project is not anticipated to have a significant effect on scenic vistas. A less than significant impact related to this topic would occur.

b) *Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway?*

Less Than Significant Impact. State Route 12 (SR 12) in Sonoma County is an Officially Designated State Scenic Highway south of the City of Santa Rosa (Caltrans 2016). SR 12 is located approximately 1.5 miles to the southwest of the project site. Motorists traveling on SR 12 have views of the Mayacama Mountains and the project site. However, development of the proposed project would involve minimal changes to the existing landscape and would not damage scenic resources including trees, rock outcroppings, or historic buildings. One of the primary goals of the Master Plan is to protect and enhance visual resources on the project site. Therefore, impacts to scenic resources within a State Scenic Highway would be less than significant.

c) *Substantially degrade the existing visual character or quality of the site and its surroundings?*

Less Than Significant Impact. Goals and policies in the Sonoma County General Plan 2020 (2008) promote the preservation of the County's rural and natural character and the regulation of development in rural areas. The project site is located in an undeveloped mountainous area, adjacent to existing Hood Mountain. Implementation of the proposed project would expand the existing Hood Mountain by approximately 247 acres.

The proposed project would not substantially degrade the existing visual character or quality of the site and its surroundings, but would improve the conditions of the site. The dilapidated barn and existing vacant residence would be demolished and replaced with a backcountry horse trough, highline, and hitching post and overnight cabin. The existing

fencing within the interior of the site and three debris piles along the northern boundary of the site would be removed, improving the overall condition of the project site. Further, the proposed trails have been designed to conform to the existing grade and 0.7 miles of trail would follow the grade of the existing Lawson trails. Therefore, impacts to the existing visual character or quality of the site would be less than significant.

d) *Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?*

Less Than Significant Impact. Implementation of the proposed project would not result in substantial new light or glare. As outlined in the project description, motion sensor, dark-sky association compliant lighting may be installed at the porch of the proposed bunkhouse and/or restroom for safety and security. The Sonoma County General Plan 2020 (2008) requires that all lighting be cast downward and be at no more than both the minimum height required and the power necessary for the proposed use. Consistent with the policies outlined in the Sonoma County General Plan, potential light fixtures would be directed downward and away from adjoining properties and public right of way, so that no on-site light fixture would directly illuminate any off-site areas. In addition, all lighting would be dark-sky association compliant. With adherence to these requirements, the proposed project would not create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area. This impact would be less than significant.

II. AGRICULTURAL AND FOREST RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project	**Potentially Significant Impact**	**Potentially Significant Unless Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to a non-agricultural use??				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X
e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forestland to non-forest use?				X

Affected Environment

The project site is mapped as "Other Land" by the California Department of Conservation Farmland Mapping and Monitoring Program (FMMP) (California Department of Conservation, Division of Land Resource Protection 2016). Other Land is land not included in any of the other mapping categories (i.e., farmland, grazing land, urban and built-up land, or water). Common examples include low density rural developments, brush, timber, wetland and riparian areas not suitable for livestock grazing, strip mines, borrow pits, and vacant and nonagricultural land surrounded on all sides by urban development that is greater than 40 acres.

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. The project site is not under a Williamson Act contract (California Department of Conservation, Division of Land Resource Protection 2013).

The project site is zoned for Resources and Rural Development (RRD) and is also located in a Biotic Habitat Riparian Corridors Combining Zone. The purpose of the RRD zoning designation is to allow very low density residential development and recreational and visitor-serving uses where compatible with resource use and available public services. In addition, the RRD zoning designation provides protection of lands containing natural resources. The Biotic Habitat Zone is established to protect and enhance the natural habitat and environmental values of biotic habitat areas. Protection of these areas helps to maintain the natural vegetation, support native plant and animal species, protect water quality and air quality, and preserve the quality of life, diversity, and unique character of the County. The Riparian Corridor Zone is established to protect biotic resource communities, including critical habitat areas within and along riparian corridors for their habitat and environmental value (Sonoma County Permit and Resource Management Department 2016).

Although the site contains forested land, no designated forest land or timberland is identified on or near the project site, and the project site is not zoned for forest or timber uses.

Discussion

a) *Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to a non-agricultural use?*

   No Impact. No Farmland is mapped on or near the project site. Therefore, the proposed project would not convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance to a non-agricultural use.

b) *Conflict with existing zoning for agricultural use, or a Williamson Act contract?*

   No Impact. The project site is not zoned for agricultural use and is not under a Williamson Act contract. Therefore, implementation of the proposed project would not conflict with existing zoning for agricultural use, or a Williamson Act contract.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

No Impact. The project area contains no forest or timberland and is not zoned for forest land, timberland, or timberland production.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. See response II(c) above.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

No Impact. See responses II (a) and II(c) above.

III. AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:	**Potentially Significant Impact**	**Potentially Significant Unless Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Conflict with or obstruct implementation of the applicable air quality plan?			X	
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			X	
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			X	
d) Expose sensitive receptors to substantial pollutant concentrations?			X	
e) Expose sensitive receptors to substantial pollutant concentrations?			X	

Affected Environment

The proposed project is located in Sonoma County, and is within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD), which regulates air quality in the San Francisco Bay Area. Air quality conditions in the San Francisco Bay Area have improved significantly since the BAAQMD was created in 1955. Ambient concentrations of air pollutants and the number of days during which the region exceeds air quality standards have fallen substantially. In Sonoma County and the rest of the air basin, exceedances of air quality standards occur primarily during meteorological conditions conducive to high pollution levels, such as cold, windless winter nights or hot, sunny summer afternoons.

Within the BAAQMD, ambient air quality standards for ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM_{10}, $PM_{2.5}$), and lead (Pb) have been set by both the State of California and the federal government. The State has also set standards for sulfate and visibility. The BAAQMD is under State non-attainment status for ozone and particulate matter standards. The BAAQMD is classified as non-attainment for the federal ozone 8-hour standard and non-attainment for the federal $PM_{2.5}$ 24-hour standard.

Discussion

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less Than Significant Impact. The applicable air quality plan is the BAAQMD's 2017 Clean Air Plan, which was adopted on April 19, 2017. The 2017 Clean Air Plan/Regional Climate Protection Strategy serves as a roadmap for the BAAQMD to reduce air pollution and protect public health and the global climate. The 2017 Clean Air Plan also includes measures and programs to reduce emissions of fine particulates and toxic air contaminants. In addition, the Regional Climate Protection Strategy is included in the 2017 Clean Air Plan, which identifies potential rules, control measures, and strategies that the BAAQMD can pursue to reduce greenhouse gases throughout the Bay Area.

Consistency with the Clean Air Plan is determined by whether or not the proposed project would result in significant and unavoidable air quality impacts or hinder implementation of control measures (e.g., excessive parking or preclude extension of transit lane or bicycle path). The proposed project would expand an existing park and develop new trails and campsites. Implementation of the proposed project would not substantially increase the population, vehicle trips, or vehicle miles traveled. In addition, as indicated in the analysis that follows, the proposed project would result in less-than-significant operational and construction-period emissions. Therefore, the proposed project supports the goals of the Clean Air Plan and would not conflict with any of the control measures identified in the plan or designed to bring the region into attainment.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less Than Significant Impact. Air pollutant emissions associated with the proposed project would occur over the short-term in association with construction activities, such as vehicle and equipment use. The project would not generate long-term regional emissions as described below.

Short-Term (Construction) Emissions. During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by demolition, excavation, grading, hauling, and other activities. Emissions from construction equipment are also anticipated and would include CO, nitrogen oxides (NO_x), reactive organic gases (ROG), directly-emitted particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants (TACs) such as diesel exhaust particulate matter.

The BAAQMD has developed screening criteria to provide lead agencies with a conservative indication of whether the proposed project would result in potentially significant air quality impacts. If all of the screening criteria are met by a proposed project, then the lead agency would not need to perform a detailed air quality assessment of the proposed project's emissions. These screening levels are generally representative of new development without any form of mitigation measures taken into consideration. In addition, the screening criteria do not account for project design features, attributes, or local development requirements that could also result in lower emissions.

For city park land uses, the BAAQMD screening size for construction criteria pollutants is 67 acres (BAAQMD 2017). The proposed Lawson expansion of the Hood Mountain Regional Park would add 247 acres to an existing 2,195 acres of space that includes trails and hike-in camping in unincorporated Sonoma County between Santa Rosa and Sonoma. However, the proposed project improvements would be limited to 4.2 miles of trails, four campsites, informal picnic areas, an overnight cabin, and limited infrastructure such as restrooms and signage. The total acreage of the improvements would be below the BAAQMD's screening criteria, and therefore, construction of the proposed project would result in a less-than-significant impact to air quality from criteria air pollutant and precursor emissions.

Long-Term (Operational) Emissions. Long-term air emission impacts are those associated with area sources and mobile sources related to the proposed project. In addition to the short-term construction emissions, the project would also generate long-term air emissions, such as those associated with changes in permanent use of the project sites. These long-term emissions are primarily mobile source emissions that would result from vehicle trips associated with the proposed project. Area sources, such as natural gas heaters, landscape equipment, and use of consumer products, would also result in pollutant emissions.

As discussed above, the BAAQMD has developed screening criteria to provide lead agencies with a conservative indication of whether the proposed project would result in potentially significant air quality impacts. If all of the screening criteria are met by a proposed project, then the lead agency would not need to perform a detailed air quality assessment of the proposed project's emissions. For city park land uses, the BAAQMD screening size for operational criteria pollutants is 2,613 acres. As identified above, the proposed Lawson expansion of the Hood Mountain Regional Park would add 247 acres to an existing 2,195 acres of open space that includes trails and hike-in camping in unincorporated Sonoma County between Santa Rosa and Sonoma. The proposed project would only include 4.2 miles of trails, four campsites, informal picnic areas, an overnight cabin, and limited infrastructure such as restrooms and signage, which would be well below the screening size. According to the Traffic Study (W-Trans 2017) for the project, the proposed project would generate approximately 25 daily trips on weekdays and 67 daily trips on weekends, which would not result in substantial emissions. Therefore, based on the BAAQMD's screening criteria, operation of the proposed project would result in a less-than-significant impact to air quality from criteria air pollutant and precursor emissions.

Localized CO Impacts. The BAAQMD has established a screening methodology that provides a conservative indication of whether the implementation of a proposed project would result in significant CO emissions. According to the BAAQMD CEQA Guidelines, a proposed project would result in a less-than significant impact to localized CO concentrations if the following screening criteria are met:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, and the regional transportation plan and local congestion management agency plans.

- Project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
- The project would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, or below-grade roadway).

Implementation of the proposed project would not conflict with the Sonoma County Comprehensive Transportation Plan for designated roads or highways, a regional transportation plan, or other agency plans. The project site is not located in an area where vertical or horizontal mixing of air is substantially limited. In addition, the proposed project would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour and would not result in localized CO concentrations that exceed State or federal standards. Therefore, this impact would be less than significant.

c) *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?*

Less Than Significant Impact. CEQA defines a cumulative impact as two or more individual effects, which when considered together, are considerable or which compound or increase other environmental impacts. According to the BAAQMD, air pollution is largely a cumulative impact and no single project is sufficient in size to itself result in nonattainment of ambient air quality standards. In developing the thresholds of significance for air pollutants used in the analysis above, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. The BAAQMD CEQA Air Quality Guidelines indicate that if a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. If daily average or annual emissions of operational-related criteria air pollutants exceed any applicable threshold established by the BAAQMD, the proposed project would result in a cumulatively significant impact.

As shown in Section III.b above, implementation of the proposed project would generate less-than-significant construction and operational emissions. Therefore, the project would not make a cumulatively considerable contribution to regional air quality impacts.

d) *Expose sensitive receptors to substantial pollutant concentrations?*

Less Than Significant Impact. Sensitive receptors are defined as residential uses, schools, daycare centers, nursing homes, and medical centers. Individuals particularly vulnerable to diesel particulate matter are children, whose lung tissue is still developing, and the elderly, who may have serious health problems that can be aggravated by exposure to diesel particulate matter. Exposure from diesel exhaust associated with construction activity contributes to both cancer and chronic non-cancer health risks.

No sensitive receptors are located in the project vicinity. The project site is located in a rural area, with few scattered residences. Construction activities associated with the project would generate airborne particulates and fugitive dust, as well as a small quantity of pollutants associated with the use of construction equipment (e.g., diesel-fueled vehicles and equipment) on a short-term basis. However, project construction emissions would be below the BAAQMD's significance thresholds and once the project is constructed, the project would not be a source of substantial emissions. Therefore, sensitive receptors are not expected to be exposed to substantial pollutant concentrations during project construction or operation, and potential impacts would be considered less than significant.

e) Create objectionable odors affecting a substantial number of people?

Less Than Significant Impact. The BAAQMD CEQA Air Quality Guidelines lists potential odor sources that could cause significant environmental impacts. The types of operations that would occur on the project site are not included in this list and would not generate objectionable odors. Some objectionable odors could be generated from the operation of diesel-powered construction equipment during the project construction period. However, these odors would be short-term in nature and would not result in permanent impacts to surrounding land uses, including sensitive receptors in the vicinity of the project site. Once constructed, the proposed project would not create objectionable odors affecting a substantial number of people or subject persons to objectionable odors. Impacts would be considered less than significant.

IV. BIOLOGICAL RESOURCES

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) Through direct removal, filling, hydrological interruption, or other means?		X		
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?		X		
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?			X	
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional, or State habitat conservation plan?				X

Kjeldsen Biological Consultants prepared a Biological Resource Survey for the project site (KBC 2010) that included background research, review of aerial photographs, field surveys, and analysis of special-status species and habitats, including wetlands. The biological resources onsite are described below and are summarized from that report.

Affected Environment

KCB (2010) identified 293 species of vascular plants in the Lawson Expansion, 211 (72 percent) native species and 82 (28 percent) non-native species. KCB mapped four broad vegetation types on the project site: grassland, oak woodlands, mixed evergreen forest, and chaparral (Figure 9). Within these broad vegetation types, the report listed 19 vegetation alliances based on Sawyer et al. (2009), but these alliances were not mapped and/or discussed in the KBC report. Those alliances with State rankings from S1 to S3 and all associations within them are considered highly imperiled and are considered sensitive communities under CEQA; a question mark (?) denotes an inexact numeric rank due to insufficient samples over the fully expected range of the type, but existing information points to this rank. Impacts to S1-S3 ranked alliances would be considered significant under CEQA. The vegetation alliances identified by KBC in the Lawson Expansion are listed below:

- *Adenostoma fasciculatum* Shrubland Alliance (Chamise chaparral)
- *Arbutus menziesii* Forest alliance (Madrone forest) S3.2
- *Arctostaphylos glandulosa* Shrubland alliance (Eastwood manzanita chaparral)
- *Avena (barbata, fatua)* Semi-Natural Herbaceous Stands (Wild oats grasslands)
- *Baccharis pilularis* Shrubland Alliance (Coyote brush scrub)
- *Bromus* (*diandrus, hordeaceus*)-*Brachypodium distachyon* Semi-Natural Herbaceous Stands (Annual brome grassland)
- *Ceanothus cuneatus* Shrubland Alliance (Wedge leaf Ceanothus chaparral or Buck brush chaparral)
- *Centaurea* (*solstitialis, melitensis*) Semi-Natural Herbaceous Stands (Yellow star-thistle fields)
- *Cynosurus echinatus* Semi-Natural Herbaceous Stands Annual dogtail grasslands
- *Danthonia californica* Herbaceous alliance (California oat grass prairie) S3
- *Elymus glaucus* Herbaceous Alliance (Blue wild rye meadows) S3?
- *Fescue idahoensis* Herbaceous Alliance (Idaho fescue grassland) S3?
- *Hesperocyparis sargentii* woodland Alliance, (Sargent cypress woodland) S3.2
- *Lasthenia californica-Plantago erecta Vulpia microstachys* Herbaceous Alliance (California goldfields-Dwarf plantain-six-weeks fescue flower fields)
- *Nassella pulchra* Herbaceous Alliance (Purple needle grass grassland) S3?
- *Phalaris aquatica* Semi-Natural Herbaceous Stands (Harding grass swards)

Hood Mountain Regional Park and Open Space Preserve Lawson Expansion

Figure 9: Vegetation Types & Sensitive Species Map

Private - Not Parkland

Private - Not Parkland

Existing Hood Mountain Park & Preserve Boundary

Lawson Expansion Property Boundary

Private - Not Parkland

Existing Hood Mountain Park & Preserve Boundary

Private - Not Parkland

Private - Not Parkland

Existing Hood Mountain Park & Preserve Boundary

Merganser Pond

USGS, County of Sonoma

- STREAM
- PRIVATE - NOT PARKLAND
- ST. HELENA MORNING-GLORY
- NAPA FALSE INDIGO
- NATIVE BUNCHGRASS
- SONOMA CEANOTHUS
- CHAPARRAL
- GRASSLAND
- MIXED EVERGREEN FOREST
- OAK WOODLANDS
- TRANSITION FOREST

N W E S

0 400 800 1,600 Feet

Data Source:
- Sonoma County Regional Parks Property Boundary, trails
- Sonoma County ISD GIS - highways, county, aerial imagery 2011,
- Lawson Biological Resources Study vegetation type

Note: This map is for illustrative purposes only and is not intended to be a definitive property description.

- *Pseudotsuga menziesii-Lithocarpus densiflorus* Forest Alliance (Douglas fir-tanoak forest)
- *Quercus agrifolia* Woodland Alliance (Coast live oak woodland)
- *Quercus* (*agrifolia, douglasii, garryana, kelloggii, lobata wislizeni*) Forest Alliance (Mixed oak forest)
- *Quercus berberidifolia* Shrubland Alliance (Scrub oak chaparral)
- *Quercus durata* Shrubland Alliance (Leather Oak Chaparral)

In addition to the native vegetation in the Lawson Expansion, ruderal habitats support various weedy non-native plant species, some of these species such as French broom (*Genista monspessulana*), yellow-star thistle (*Centaurea solstitialis*), and silverleaf cotoneaster (*Cotoneaster pannosus*) are invasive species.

Regulated Waters. The KCB Biological Resources Report did not identify any wetlands in the Lawson Expansion, but noted that several drainages are present on the project site. The proposed Wild Lilac Trail would cross several ephemeral streams that are under the jurisdiction of the Corps, RWQCB and CDFW. Permits from these agencies would be required if trail crossings impact these streams.

Wildlife. KCB (2010) recorded 21 species of wildlife in the Lawson Expansion, but, based on the habitat types present on the site, a diverse assemblage of other wildlife species typical of the mountains in eastern Sonoma County is expected to be present. Bird species reported by KCB (2010) include red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*B. lineatus*), acorn woodpecker (*Melanerpes formicivorus*), pileated woodpecker (*Dryocopus pileatus*), wrentit (*Chamaea fasciata*), American robin (*Turdus migratorius*), and spotted towhee (*Pipilo maculatus*), which are all common permanent resident species in Sonoma County (Bolander and Parmeter 2000). LSA added the common raven (*Corvus corax*) to the list during their field survey on November 29, 2016, but many more resident and migratory species are likely present on the project site.

Mammals observed or detected by KCB (2010) included species typical of oak woodland, mixed coniferous forest, chaparral, and grassland. Larger to mid-sized species included coyote (*Canis latrans*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and mule deer (*Odocoileus hemionus*). Small mammals included broad-footed mole (*Scapanus latimanus*), western gray squirrel (*Sciurus griseus*), deer mouse (*Peromyscus maniculatus*), dusky-footed woodrat (*Neotoma fuscipes*), and Botta's pocket gopher (*Thomomys bottae*). Other species of mammals likely to occur include mountain lion (*Puma concolor*), shrews, and various species of bats.

Amphibians and reptiles observed by KCB (2010) included Pacific tree frog (*Hyliola regilla*), common garter snake (*Thamnophis sirtalis*), and western fence lizard (*Sceloporus occidentalis*). Other species known from this area and likely to be present on the project site include California slender salamander (*Batrachoseps attenuatus*), ensatina (*Ensatina eschscholtzii*), western skink (*Plestiodon skiltonianus*), southern alligator lizard (*Elgaria multicarinata*), gopher snake (*Pituophis catenifer*), California mountain kingsnake (*Lampropeltis zonata*), and western rattlesnake (*Crotalus oreganus*).

Special-Status Species. Three special-status plant species were identified in the Lawson Expansion: Napa false indigo (*Amorpha californica* var. *napensis*), Mount Saint Helena mourning-glory (*Calystegia collina* spp. *oxyphylla*), and Sonoma ceanothus (*Ceanothus sonomensis*). The site-specific information on the Napa false indigo and Sonoma ceanothus is from the KCB (2010) biological resources study conducted for the Lawson Expansion. Both Napa false indigo and Sonoma ceanothus have a California rare plant rank of 1B; this rank refers to species that are rare throughout their range with the majority of them endemic to California. Impacts to 1B plant species are generally considered significant under CEQA. The Mount Saint Helena mourning-glory (*Calystegia collina* spp. *oxyphylla*) has a rare plant rank of 4.2; species with this rank are considered uncommon, but impacts to 4.2 species are generally not considered significant under CEQA.

Within the Lawson Expansion, Napa false indigo is only known from a small population along the northern boundary of the project site (Figure 9); about 20 plants were observed at this location. This population is remote from any of the proposed trail locations (Figure 10).

Sonoma ceanothus in the Lawson Expansion site occurs in a concentrated area in serpentine chaparral (Figure 10). Approximately 500 individual shrubs are located in this area. The proposed Wild Lilac Multi-Use trail would be located on an existing alignment that traverses the edge of this stand of chaparral. This area was affected by the Sonoma County fires, as well as fire suppression activities, that occurred in October 2017. As described previously, grasslands dozed to create the fire safety zone were seeded with native grass seed and covered with straw to repair suppression damage. No new disturbance would be required to accommodate the proposed trail.

Madrone forest (S3.2), California oat grass prairie (S3), blue wild rye meadows (S3?), Idaho fescue grassland (S3?), purple needle grass grassland (S3?), and Sargent cypress woodland (S3.2) are vegetation alliances that are considered special-status natural communities. Impacts to S1-S3 ranked vegetation alliances would be considered significant under CEQA.

No special-status animal species were observed in the Lawson Expansion during the biological survey conducted by KCB; however, an occurrence record of the northern spotted owl (*Strix occidentalis caurina*) is located approximately 0.25 miles (1,320 feet) north of the northwest edge of the project site. The northern spotted owl is a federal and State listed threatened species. The biological resources report did not identify suitable nesting habitat for the northern spotted owl in the Lawson Expansion; however; the mixed evergreen forest in the western portion of the project site could be used by dispersing owls. In any event, with the exception of the Lawson Camp Loop which passes through a stand of Douglas firs (*Pseudotsuga menziesii*) on the eastern edge of this forest, the proposed trails mostly avoid this area.

The olive-sided flycatcher (*Contopus cooperi*), a California Species of Special Concern (Shuford and Gardali 2008) likely occurs on the project site during spring and summer (Bolander and Parmeter 2000) and is a potential nester in the tall coniferous trees on the site; however, these birds nest in tall trees and would not likely be affected by trail construction and use.

Hood Mountain Regional Park and Open Space Preserve Lawson Expansion

Figure 10: Trails - Plant Communities Overlay Map

Private - Not Parkland

Existing Hood Mountain Park & Preserve Boundary

Lawson Expansion Property Boundary

Merganser Pond

USGS, County of Sonoma

Data Source:
- Sonoma County Regional Parks Property Boundary, trails
- Sonoma County ISD GIS - highways, county, aerial imagery 2011;
- Lawson Biological Resources Study vegetation type

Note: This map is for illustrative purposes only and is not intended to be a definitive property description.

- STREAM
- SERVICE RD
- EXISTING PARK TRAILS
- PROPOSED MULTI-USE TRAIL
- PROPOSED HIKER ONLY TRAIL
- PROPOSED TRAIL ON EXISTING ALIGNMENT
- ST. HELENA MORNING-GLORY
- NAPA FALSE INDIGO
- NATIVE BUCHGRASS
- SONOMA CEANOTHUS
- CHAPARRAL
- GRASSLAND
- MIXED EVERGREEN FOREST
- OAK WOODLANDS
- TRANSITION FOREST

0 400 800 1,600 Feet

Discussion

a) *Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?*

Potentially Significant Unless Mitigation Incorporated. As described above, plant and animal species that are identified as candidate, sensitive, or special status species have been found in and around the project site. Although the MP/RMP proposes to improve wildlife habitat through the enhancement of natural communities on the project site, construction or placement of trails, camping facilities, bunkhouse, and restroom and other facilities could impact protected species. Implementation of MP/RMP goals and guidelines would ensure that the locations for any of these facilities would be carefully chosen so as to minimize impacts to special status species. Avoidance of sensitive species would be a primary consideration in the siting of any recreational trails and other facilities. The closure of certain trails would benefit special status species by moving human traffic and impacts away from especially sensitive resources. Minimal impacts to listed threatened or endangered species associated with development of proposed facilities would be outweighed by the benefits of MP/RMP implementation to habitat for such species, and would be subject to appropriate approvals as described in the following mitigation measure.

Mitigation Measure BIO-1: Prior to construction of any new trails, or other facilities, an assessment of potential specific effects on candidate, sensitive or special status species shall be performed in consultation with applicable resource agencies. If there are any potential impacts to special status species, appropriate authorizations from the U.S. Army Corps of Engineers, California Department of Fish and Wildlife and U.S. Fish and Wildlife Service shall be obtained. It is expected that any such impacts will be relatively minor, and any mitigation required by the agencies can be accomplished through enhancement of existing resources within the Lawson Expansion. Prior to construction of any trails or other facilities, mitigation measures, identified and approved by the regulatory agencies as sufficient to fully offset all identified impacts, shall be incorporated into the project and implemented by Regional Parks. Mitigation measures would include, but are not limited to, placement of exclusion fencing or flagging to avoid habitat areas, restoration and/or replacement of suitable habitat, construction monitoring, and potential relocation of individual species, if needed.

b) *Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?*

Potentially Significant Unless Mitigation Incorporated. Sensitive natural communities such as madrone forest, California oat grass prairie, blue wild rye meadows, fescue grassland, purple needlegrass grassland, and Sargent cypress woodland are located within the Lawson Expansion. Construction or placement of trails and other facilities could result in the removal of small amounts of sensitive habitat. However, implementation of MP/RMP goals and guidelines would ensure that the locations for any

of these facilities would be carefully chosen so as to minimize impacts to sensitive habitats. Avoidance of sensitive habitats would be a primary consideration in the siting of any recreational trails and facilities. Minimal impacts associated with development of proposed facilities would be outweighed by the benefits to native habitats resulting from implementation of the proposed project, e.g., through enhancement of native vegetation, removal of some trails, and trail maintenance and management. Any minor impacts that are subject to jurisdiction of the U.S. Fish and Wildlife Service or California Department of Fish and Wildlife would be addressed through compliance with Mitigation Measures BIO-1 (described above) and BIO-2 (described below).

c) *Would the project have a substantial adverse effect on federally-protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?*

Potentially Significant Unless Mitigation Incorporated. As described above, KCB Biological Resources Report did not identify any wetlands in the Lawson Expansion, but noted that several drainages are present on the project site. Waters of the U.S. and State may be impacted by improvements, particularly new trail construction and maintenance and improvement of existing trails where those improvements are located adjacent to or across drainages. However, implementation of MP/RMP goals and guidelines would ensure that the locations for any of these facilities would be carefully chosen so as to minimize impacts to wetlands. Implementation of the following mitigation measures would reduce impacts to jurisdictional wetlands to less than significant.

Mitigation Measure BIO-2: Prior to construction of any new trails, or other facilities, a jurisdictional determination shall be performed, and if there are any impacts to jurisdictional waters, appropriate authorizations from the U.S. Army Corps of Engineers, California Department of Fish and Wildlife and Regional Water Quality Control Board shall be obtained. It is expected that any such impacts will be relatively minor, and any mitigation required by the agencies can be accomplished through enhancement of existing resources within the Lawson Expansion. Prior to construction of any trails or other facilities, mitigation measures, identified and approved by the regulatory agencies as sufficient to fully offset all identified impacts, shall be incorporated into the project and implemented by Regional Parks. Fill of jurisdictional features will be mitigated at a minimum ratio of 1:1 (no net loss) through restoration or creation of wetland areas on the project site. A wetland mitigation plan shall be developed for any required mitigation. The plan shall include performance standards for the mitigation wetlands, which wil be monitored for at least 5 years. The results of the monitoring shall be reported in annual reports submitted to the responsible regulatory agencies.

Mitigation Measure BIO-3: Regional Parks shall prepare and submit an Erosion Control Plan to Sonoma County that shall include construction specifications for grading plans, project designs, and other relevant information. The Applicant shall comply with any measures outlined by the County of Sonoma, RWQCB, Corps, and California Department of Fish and Wildlife (CDFW) with regard to seasonal

water and erosion control issues. The following measures to control erosion and sedimentation from the proposed project shall be implemented:

- If determined to be necessary, sediment control measures may include inlet protection, straw bale barriers, straw mulching, straw wattles, and other recommendations from the County of Sonoma.
- Disturbance within the project area shall be kept to a minimum.

Immediately after vegetation has been removed, one or more barriers of silt fencing may be installed, if determined to be necessary, at the downslope end of the work area to prevent sediments and debris from washing into downstream water sources. This fencing would be maintained throughout construction, and sediment that settles against it would be removed, as necessary, in order to ensure the continued functioning of the silt fencing as a water filtration measure. If large rainfall events or heavy stream flow are anticipated during the construction period, the fencing may be temporarily removed.

- The soil and rock fill shall be compacted to prevent erosion and washouts.
- Periodic inspections shall be provided during construction to ensure that all measures are in place.

d) *Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?*

Potentially Significant Unless Mitigation Incorporated. Implementation of the MP/RMP, which proposes development of additional recreational and interpretive facilities, would have only minor effects on the movement of wildlife species. These impacts would be more than offset by the MP/RMP goals, objectives and strategies to protect and enhance wildlife corridors (e.g., through preservation of native vegetation, and trail maintenance and management).

Construction activities on the site could temporarily affect nesting birds both on and adjacent to the site if trees, or other vegetation, containing active nests are removed during the nesting season (February 1 – August 31) or construction activities disturb nesting birds adjacent to the project site resulting in nest abandonment or failure. The nests and eggs of native bird species are protected under the federal Migratory Bird Treaty Act and Section 3503 of the California Fish and Game Code. Trees and shrubs on the project site, if occupied by nesting native birds, would be considered a wildlife nursery site under CEQA. Therefore, destruction or abandonment of an active nest as a result of project related activities would result in direct effects to a wildlife nursery site. Implementation of Mitigation Measure BIO-4 would ensure that potential impacts to protected native bird species, including nesting special-status bird species if present, would be reduced to a less than significant level.

Mitigation Measure BIO-4: If construction is proposed to occur during the nesting season (February 1 through August 31), a qualified biologist shall conduct nesting bird surveys prior to tree pruning, tree removal, ground disturbing activities, or

construction activities to locate active nests on or immediately adjacent to the project site.

- Preconstruction surveys shall be conducted no more than 14 days prior to initiation of construction activities or tree trimming/removal. If the project is delayed, additional preconstruction surveys at 14-day intervals shall be completed until project construction is initiated on the site.
- Locations of active nests shall be described and protective measures implemented. Protective measures shall include establishment of clearly delineated (i.e., orange construction fencing) exclusion zones around each nest sites. The exclusion zone shall have a radius of 50 to 250 feet centered on the nest tree. The size of the exclusion zone shall be determined by a qualified biologist and shall take into consideration the bird species and the level of disturbance anticipated near the nest. Typically, exclusion zones for passerines are 50 feet, while those for raptors may be up to 250 feet.
- Active nest sites shall be monitored periodically throughout the nesting season to identify any sign of disturbance. These protection measures shall remain in effect until the young have left the nest and are foraging independently or the nest is no longer active.
- Exclusion zones may be reduced in size, if in the opinion of the project biologist and in consultation with the California Department of Fish and Wildlife, a smaller exclusion zone is determined to adequately protect the active nest. Additional monitoring (i.e., daily) may be required to monitor the behavior of the nesting birds if the exclusion zones are reduced in size. The project biologist shall be responsible for determining if the smaller exclusion zones are effective.
- The project biologist shall prepare a report at the end of the construction season detailing the results of the preconstruction surveys and monitoring. The report shall be submitted to Regional Parks by November 30 of each year.

e) Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Less Than Significant Impact. "Protected trees" in Sonoma County are subject to the County's Tree Protection Ordinance (Section 26-88-010(m) of the Sonoma County Code). Protected trees include: big leaf maple (*Acer macrophyllum)*, black oak (*Quercus kelloggii)*, blue oak (*Quercus douglasii)*, coast live oak (*Quercus agrifolia)*, interior live oak (*Quercus wislizenii)*, madrone (*Arbutus menziesii)*, oracle oak (*Quercus morehus)*, Oregon oak *Quercus garryana*, redwood (*Sequoia sempervirens)*, Valley oak (*Quercus lobata)*, California bay (*Umbellularia California)* and their hybrids.

Construction or placement of new trails and other facilities is not anticipated to result in the removal of any "protected" trees. Implementation of MP/RMP goals and guidelines would ensure that the locations for any of these facilities would be carefully chosen so as to minimize impacts to sensitive resources, including heritage trees. Resource protection would be a guiding principal for locating trails within the project site.

Further Regional Parks would comply with all provisions of the Sonoma County Tree Protection Ordinance, including: protection of trees to remain, replacement of trees to be removed, and protection of "protected" trees during project construction. All trees proposed for removal shall be replaced pursuant to Section 26-88-010 (m) of the Sonoma County Code.

Compliance with the Sonoma County Tree Protection Ordinance, in addition to the MP/RMP goals and guidelines would ensure impacts to "protected" trees would be less than significant. No mitigation is required.

f) Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional, or State habitat conservation plan?

No Impact. No approved local, regional, or State habitat conservation plans apply directly to the project area. Therefore, implementation of the MP/RMP would not conflict with the provisions of habitat conservation plans.

V. CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?		X		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5??		X		
c) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?		X		
d) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?		X		

Affected Environment

Steen and Origer (2006) conducted a cultural resources study for the project site at the request of Regional Parks. The study included (1) a review of cultural resource studies and records on file at the Northwest Information Center (NWIC) at Sonoma State University;[3] (2) a review of ethnographic literature and historical maps relevant to the project site; (3) consultation with local Native American tribes identified by the Native American Heritage Commission; and (4) a mixed-strategy cultural resources field survey that examined areas of high potential for pre-contact and historic-period archaeological remains.

The 2006 study identified four pre-historic and/or historical cultural resource sites in the Lawson Expansion: a Native American cultural resource of undetermined age and three historic-period cultural resources. In addition, 15 isolated artifacts were identified. Specific locations of archaeological sites and artifacts are not disclosed to prevent vandalism and unauthorized collection. Regional Parks is working collaboratively with the local Tribes that consider the land within their ancestral territory, to protect and interpret the sites pre-historic cultural resources.

CA-SON-67 (pre-historic confidential information). This site consists of a Native American resource. To protect this site from vandalism and unauthorized visitation, a description of the resource and its location are withheld in this document. The legal authority

[3] The NWIC is the State's regional repository for cultural resource records and reports for Sonoma County.

to restrict cultural resource information is in California Government Code Section 6254.10 and 6254(r). This site is included in resource protections provided for in the MP/RMP.

Historic Material Scatter. This site consists of a scatter of domestic artifacts including solarized glass, brown and green glass, a medicine bottle base, and ceramic tableware fragments. The materials scatter occupies an area approximately 25 feet in diameter and is bisected by a dirt road. Historical maps do not indicate a building at this location, and this site may represent a discrete dumping episode.

Holst Homestead Site. This site consists of the remains of an early 20th-century homestead associated with John Holst. Holst was born in Minnesota in 1875 and moved with his family to California sometime between 1885 and 1888. In June of 1906, John Holst received a homestead certificate for 160 acres in the uplands east of Santa Rosa, and added 90 acres from the Streiff homestead (see discussion below) to his holding in 1917. The extent of Holst's homestead roughly corresponds to the project site boundary.

In the "proving up" documentation that Holst filed—a requirement of the 1862 Homestead Act to document occupation and improvement of the land prior to taking legal possession—Holst noted that he built a 16- by 37-foot four-room house on his land in 1899. In addition to the house, he constructed a shake-roof barn, a 54-foot-deep well, and two miles of road, and installed a mile of barbwire fence. The original house and most other buildings have been demolished. A barn and a few fruit trees remain to mark the Holst homestead.

Little is known about John Holst's life. Census data show Marie Robinson lodging with Holst in 1920, and both Marie and her 35-year-old son, Henry, were lodgers in 1930. Former neighbor, Willard Johnson, recalls that Holst and Robinson had a subsistence garden and hired themselves out from time to time to earn money.

John Holst died in 1959 and left his property to Henry Robinson. Robinson kept the property for nine years before moving to Washington to live with his sister. He sold the property to Evelyn and Carl Lawson, and Fritz Brand. In 2005, the property was acquired by the County of Sonoma.

In 2009, the Holst Homestead Site was recorded in detail and evaluated for its eligibility for listing in the California Register of Historical Resources (CRHR) (Beard 2009a). The recording identified archaeological features at the site, including the former locations of the house, outbuildings, and a pigpen; a backfilled privy and well location; and concentrations of scattered structural debris and trash likely associated with Holst's occupation of the site. The existing barn is the one extant building associated with the Holst Homestead Site; however, while the barn is an essential element of the homestead, it no longer has the potential to yield information about homesteading. As a result, the 2009 evaluation determined that preservation was not warranted and no further treatment was required (Beard 2009a). A house currently occupies the site, although this building is not associated with Holst and has no historic significance.

The evaluation of the Holst Homestead determined that the site is eligible for listing in the CRHR under Criterion 1 and 4 (CEQA Guidelines Section 15064.5(a)(3)). In order to be considered important under Criterion 1, a resource must be associated with events that were historically significant on a local, state, or national level. The Holst Homestead site is associated with the United States' homesteading program, which served as the impetus for settlement of the American west and resulted in over 6,700 homesteads patented in Sonoma County. This site meets Criterion 1 through its association with that theme, and the archaeological remains at this site could be studied to enhance our understanding of the homesteading experience.

Criterion 4 applies to archaeological deposits, or other resources that through study of construction details can provide information that cannot be obtained in other ways. Given John Holst's long tenure at this location, the archaeological deposits and/or features at this site could provide information about his homesteading experience and homesteading, in general.

Streiff Homestead Site. This site consists of the remains of a late 19th-century and early 20th-century homestead associated with John Streiff. Streiff was born in Switzerland and arrived in the United States in 1857. Streiff settled a 130-acre parcel in 1887 under the Homestead Act of 1862 in the uplands east of Santa Rosa. Ninety acres of Streiff's homestead are within the project site.

In his "proving up" documentation, Streiff indicated that he had built an 8 by 12 foot one-room house and cultivated vegetables, a garden, and orchard on his property. Streiff applied for the homestead in 1893 and received his patent to the land in 1899. In 1902, Streiff purchased 166 acres adjacent to his homestead. He sold all his property five years later, and by 1910 was living in Bodie, California. Streiff's house is no longer standing at this site, although evidence of his occupation remains.

In 2009, the Streiff Homestead Site was recorded in detail and evaluated for its eligibility for listing in the CRHR (Beard 2009b). The recording identified archaeological features at the site, including the possible former location of a house, a back-filled well, a stone retaining wall and stone fence, and structural debris and trash possibly associated with Streiff's occupation of the site.

The evaluation of the Streiff Homestead determined that the site is eligible for listing in the CRHR under Criterion 1 and 4 (CEQA Guidelines Section 15064.5(a)(3)).

Discussion

a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

Potentially Significant Unless Mitigation Incorporated. The cultural resources study identified four pre-historic and/or historical cultural resources sites in the Lawson Expansion. Two sites, the Holst Homestead and the Streiff Homestead, are eligible for the CRHR. As part of proposed improvements, Regional Parks would remove the existing barn on the site. As described above, the 2009 evaluation determined that preservation of the barn was not warranted and no further treatment was required

(Beard 2009a). In addition, the goals and guidelines of the MP/RMP are to preserve the definitive elements of these sites and provide interpretive signage to educate the public on the importance of these resources. The MP/RMP identifies numerous actions to identify and protect cultural resources including: establishing protective barriers to prevent authorized access and vandalism, preparing and implementing treatment plans for the Holst and Streiff homestead sites, avoiding resources, monitoring of earth-disturbing activities, and establishing interpretive panels at appropriate locations. With implementation of the actions identified in the MP/RMP to protect known cultural resource on the project site, this impact would be less than significant.

It is also possible that additional historical or archaeological resources could be discovered during ground disturbing activities associated with fire prevention activities, resource management activities, or construction of new trails and/or recreational facilities. However, implementation of the following mitigation measures would reduce potential impacts to unknown cultural resources to a level below significance.

> **Mitigation Measure CULT-1:** During ground disturbing activities, a qualified archaeologist shall be consulted if additional unknown historical or archaeological resources are discovered during improvements or routine maintenance within the Lawson Expansion. The archaeologist shall evaluate the find pursuant to the CEQA guidelines and make recommendations for its treatment.
>
> **Mitigation Measure CULT-2:** Should sensitive areas that are currently obscured by vegetation be cleared, a cultural resources survey shall be performed immediately after, or as close to that time as possible, when ground visibility would be at its highest.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

Potentially Significant Unless Mitigation Incorporated. As described above in Response V.a., four pre-historic and/or historical cultural resources sites have been identified in the Lawson Expansion. Because the MP/RMP identifies numerous actions to identify and protect cultural resources, implementation of the proposed project is not expected to impact cultural resources.

Due to the potential for encountering unanticipated cultural resources during construction, the project may result in significant impacts to unique archaeological resources.

Implementation of Mitigation Measures, CULT-1 and CULT-2, described previously, would reduce potential impacts from construction activities to less than significant. The reduction would be achieved either through the avoidance of direct impacts to identified resources, or evaluation and treatment of such resources in a manner that recovers scientifically consequential data that would otherwise be lost through disturbance.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Potentially Significant Unless Mitigation Incorporated. Given the nature of project construction and the relatively shallow depth of excavation required, it is unlikely that paleontological resources would be encountered. Though unlikely, this possibility cannot be entirely discounted. If encountered, such resources could qualify as significant for the scientific data they contain relating to ancient life, in which case their disturbance could possibly result in a significant impact.

Implementation of Mitigation Measure CULT-3, described below, would reduce potential impacts from construction activities to less than significant. The reduction would be achieved either through the avoidance of direct impacts to identified resources, or evaluation and treatment of such resources in a manner that recovers scientifically consequential data that would otherwise be lost through disturbance.

> **Mitigation Measure CULT-3:** Should paleontological resources be encountered during project subsurface construction activities, all ground-disturbing activities within 25 feet shall be redirected and a qualified paleontologist contacted to assess the situation, consult with Regional Parks' representatives, and make recommendations for the treatment of the discovery. If the find is determined to be significant, and project activities cannot avoid impacting the resource, the impact to the resource shall be mitigated in accordance with the recommendations of the consulting paleontologist. Mitigation may include monitoring, recording the fossil locality, data recovery and analysis, a final report, and accessioning the fossil material and technical report to a paleontological repository. Public educational outreach may also be appropriate. Upon completion of the assessment, a report documenting methods, findings, and recommendations of the investigation shall be prepared and submitted to the Regional Parks, and, if paleontological materials are recovered, a paleontological repository, such as the University of California Museum of Paleontology.

d) Disturb any human remains, including those interred outside of formal cemeteries?

Potentially Significant Unless Mitigation Incorporated. No human remains have been identified within the Lawson Expansion and it is unlikely that human remains are present within the project site. However, it is possible that human remains could be disturbed as a result of ground disturbing activities associated with habitat enhancement/restoration activities or construction of new trails, or other recreational facilities.

Implementation of Mitigation Measure CULT-4, described below, would reduce potential impacts from construction activities to less than significant. The reduction would be achieved through the adherence to the requirements of California Health and Safety Code Section 7050.5 (as summarized below) and the treatment of such remains in a respectful manner, with the input of descendant communities.

> **Mitigation Measure CULT-4:** If human remains are encountered during ground disturbing activities, work within 25 feet of the discovery shall be redirected and the Sonoma County Coroner notified immediately. At the same time, the archaeologist who served as monitor or consulting archaeologist shall be contacted to assess the situation, in consultation with the descendant community also involved with the pre-

construction testing, as well as the Coroner's representative. Project personnel shall not collect or move any human remains and associated materials. If the human remains are of Native American origin, the Coroner shall notify the Native American Heritage Commission within 24 hours of this identification. The Native American Heritage Commission will identify a Most Likely Descendant (MLD), which will likely be the representative of the descendant community already involved, to inspect the site and provide recommendations for the proper treatment of the remains and associated grave goods. Upon completion of the assessment, the archaeologist shall prepare a report documenting the investigation's methods and results, and provide recommendations for the treatment of the human remains and any associated cultural materials, as appropriate and in coordination with the recommendations of the MLD. The draft report shall be submitted to Regional Parks, the descendant community involved in the treatment of the resources, and the Northwest Information Center, as required by law.

VI. GEOLOGY AND SOILS

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X
ii) Strong seismic ground shaking?		X		
iii) Seismic-related ground failure, including liquefaction?			X	
iv) Landslides?		X		
b) Result in substantial soil erosion or the loss of topsoil?			X	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?		X		
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?		X		
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X

Affected Environment

The project site is located on the Santa Rosa Plain in Central Sonoma County within the Coast Range Geomorphic Province of Northern California. This province is generally characterized by northwest-trending mountain ranges and intervening valleys, which are a reflection of the dominant northwest structural trend of the bedrock in the region.

The San Andreas Fault trends along the western margin of the County. In addition to the San Andreas Fault, the Healdsburg-Rodgers Creek, and Mayacamas faults are located within the County and are all considered active faults. The project site is not located within a State-designated Alquist-Priolo Earthquake Fault Zone (California Department of Conservation 1983).

The majority of the soils in the project area are Boomer loam and Henneke soil series (NRCS 2016). The Boomer soil series consist of well-drained loams, clay subsoil, and are underlain by greenstone and metamorphosed rock. These soils are located throughout the project area. This soil series has a high erosion rate, particularly on slopes of 9 to 30 percent. The Boomer soils have a moderate infiltration and water transmission rate, moderate runoff potential, and moderate shrink-swell potential. The Henneke soil series is located in the eastern portion of the project site. This soil type consists of a very well-drained gravelly loam underlain by serpentine bedrock. They have a very slow infiltration and water transmission rate and very high runoff potential. Rock land is located within the middle portion of the project site. These rocky areas are characterized by stony, steep slopes and ridges with minimal soil accumulation.

Discussion

a) *Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:*

   i) *Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.*

   No Impact. Surface rupture occurs when the ground surface is broken due to fault movement during an earthquake. The location of surface rupture generally can be assumed to be along an active or potentially active major fault trace. The project site is not located within a currently designated Alquist-Priolo Earthquake Fault Zone. The nearest Alquist-Priolo Earthquake Fault Zone is the Healdsburg-Rodgers Creek Fault, located approximately 7 miles west of the project; therefore, the potential for fault rupture to occur at the project site is low. Implementation of the proposed project would expand the size of the existing Hood Mountain and add new trails and campsites. The proposed project would not increase the risks to human health or safety related to fault rupture compared to the existing conditions. Therefore, a less than significant impact would occur related to this topic.

ii) Strong seismic ground shaking?

Potentially Significant Unless Mitigation Incorporated. The project site and the entire San Francisco Bay Area is in a seismically active region subject to strong seismic ground shaking. Ground shaking is a general term referring to all aspects of motion of the earth's surface resulting from an earthquake, and is normally the major cause of damage in seismic events. The extent of ground-shaking is controlled by the magnitude and intensity of the earthquake, distance from the epicenter, and local geologic conditions. As described above, the major active faults in the County that could cause ground shaking at the project site include the San Andreas Fault, Healdsburg, Rodgers Creek, and Mayacamas faults. According to Figure PS-1a of the Sonoma County General Plan 2020 (Sonoma County 2008), the project site is located in an area of "very strong" and "strong" ground shaking probability. Therefore, it is likely that the project site would be subject to seismic ground shaking during an earthquake.

Mitigation Measure GEO-1 requires the preparation of a geotechnical report and incorporation of geotechnical recommendations and California Building Code (CBC) requirements for construction of the proposed overnight cabin and any proposed modifications to the existing water tank. The CBC stipulates appropriate seismic design provisions that shall be implemented with project design and construction. Therefore, with implementation of Mitigation Measure GEO-1, potential project impacts related to seismic ground shaking would be reduced to a less than significant level.

The most significant adverse impact associated with strong seismic shaking is potential damage to structures and improvements. With the exception of the proposed overnight cabin, no habitable structures would be constructed as part of the proposed project. Proposed improvements (e.g., interpretive facilities, trails) would be designed and constructed consistent with County seismic design requirements, as well as all applicable federal and state regulations for construction activities relevant to trails. Mitigation Measure GEO-2 specifies best management practices (BMPs) to reduce potential impacts associated with construction of minor improvements such as trails and campsites.

> **Mitigation Measure GEO-1:** Prior to grading, excavation, and construction of the proposed overnight cabin or modifications to the existing water tank under the MP/RMP, a design-level geotechnical report shall be prepared by a licensed professional and submitted to Sonoma County Parks staff for review and approval. The geotechnical review shall specifically address potential adverse geological conditions at the site, including but not limited to expansive soils and seismic shaking and verify that the project plans incorporate the current California Building Code requirements, and other applicable design standards. All design measures, recommendations, design criteria, and specifications set forth in the design-level geotechnical review shall be implemented as a condition of project approval.

Mitigation Measure GEO-2: Regional Parks shall implement the following best management practices (BMPs) in designing and constructing minor improvements such as trails and campsites:

- Ground-disturbing work shall be scheduled during the dry season, to the extent feasible, when associated erosion can be reduced the maximum to minimize the potential for slope failure.
- Location of landslides shall be confirmed prior to trail construction. Trails shall be routed to avoid cuts across steep slopes and any areas of active landslides.
- Trails shall be routed, where feasible, above trees and large outcroppings to avoid roots and to utilize the structural support they provide. If appropriate, root systems shall be left in place during vegetation management activities.

With implementation of Mitigation Measures GEO-1 and GEO-2, potential project impacts related to seismic ground shaking would be reduced to less than significant.

iii) Seismic-related ground failure, including liquefaction?

Less Than Significant Impact. Liquefaction is the transformation of saturated, loose, fine-grained sediment to a fluid-like state because of earthquake shaking or other rapid loading. Soils most susceptible to liquefaction are loose to medium dense, saturated sands, silty sands, sandy silts, non-plastic silts and gravels with poor drainage, or those capped by or containing seams of impermeable sediment. The project site is located in an area with very low susceptibility to liquefaction (ABAG 2016). Therefore, impacts associated with liquefaction would be less than significant.

iv) Landslides?

Potentially Significant Unless Mitigation Incorporated. Due to the presence of unstable rock and soil units and steep slopes, most of the project site is identified as an area with high or moderate potential for landslides (Sonoma County 2008). The proposed improvements would be required to comply with the specifications in the CBC and project-specific geotechnical report, as specified in Mitigation Measure GEO-1. Therefore, with implementation of Mitigation Measure GEO-1, potential project impacts related to landslides would be reduced to a less than significant level.

b) Result in substantial soil erosion or the loss of topsoil?

Less Than Significant Impact. As a result of the fires in October 2017, some of the trees and vegetation on the site were burned and some grassland areas were cleared to provide a fire safety zone on Lawson Peak. Following the fires, Regional Parks seeded cleared areas with native seed and covered them with straw. As of spring 2018, these areas are beginning to revegetate. Regional Parks has been monitoring the site for potential erosion hazards, and will continue to do so consistent with the policies in the MP/RMP.

Development of additional trails and campsites on the site has the potential to result in erosion, particularly in areas with steep slopes. Trail development would be required to implement measures to avoid erosion, as described in the MP/RMP.

During construction activities associated with proposed improvements, soil would be exposed and there would be an increased potential for soil erosion compared to existing conditions. The increased erosion potential could result in short-term water quality impacts, as discussed in Section IX Hydrology and Water Quality. As specified in the MP/RMP, Regional Parks will maintain proposed improvements, identify and evaluate erosion areas, and identify and implement specific BMPs in the design, construction, and maintenance of trails and other improvements to control erosion and sediment (REC-1.5, MAINT-1.3 and MAINT-1.4). In addition, all construction activities would follow the Sonoma County Permit and Resource Management Department's Erosion Prevention and Sediment Control Practices for Effective Construction Site Management.

With implementation of the measures outlined in the MP/RMP and local regulations for reducing erosion and loss of topsoil, impacts related to erosion and loss of topsoil would be less than significant.

c) *Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?*

Potentially Significant Unless Mitigation Incorporated. As described above, the potential for landslides to occur is moderate to high and the potential for liquefaction is very low. The project site is not located on Karst formations and has not been subjected to mining activities; thus, the risk of subsidence or collapse is expected to be low. The proposed project would be designed and constructed with adequate foundations and bedding in accordance with the CBC and standard engineering practices, as specified in Mitigation Measures GEO-1 and GEO-2 to address the possible effects of unstable soils. Therefore, with implementation of Mitigation Measure GEO-1 and GEO-2, potential project impacts related to unstable soils would be reduced to a less than significant level.

d) *Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?*

Potentially Significant Unless Mitigation Incorporated. Expansion and contraction of volume can occur when expansive soils undergo alternating cycles of wetting (swelling) and drying (shrinking). During these cycles, the volume of the soil changes markedly. Expansive soils are common throughout California and can cause damage to foundations and slabs unless properly treated during construction. The Boomer soil series have moderate shrink-swell potential and the Henneke soil series are not considered expansive. Standard construction methods would be employed including appropriate selection of backfill materials that do not exhibit expansive behavior. Implementation of Mitigation Measure GEO-1 and GEO-2, described above, would reduce potential impacts related to expansive soils to less than significant.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No Impact. Septic tanks would not be installed on the project site. Implementation of the proposed project would install a permanent waterless, pump-out restroom facility to service the four campsites and overnight cabin. Because septic tanks and other waste water disposal systems would not be installed on the site, the project would not result in impacts related to the soils capability to adequately support the use of septic tanks or alternative wastewater disposal systems.

VII. GREENHOUSE GAS EMISSIONS

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment, based on any applicable threshold of significance?			X	
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?				

Affected Environment

Greenhouse gases (GHGs) are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced global climate change are:

- Carbon dioxide (CO_2);
- Methane (CH_4);
- Nitrous oxide (N_2O);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Sulfur Hexafluoride (SF_6).

Over the last 200 years, humans have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere and enhancing the natural greenhouse effect, believed to be causing global warming. While manmade GHGs include naturally-occurring GHGs such as CO_2, methane, and N_2O, some gases, like HFCs, PFCs, and SF_6 are completely new to the atmosphere.

Certain gases, such as water vapor, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of GHGs above because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

These gases vary considerably in terms of Global Warming Potential (GWP), a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP is based on several factors, including the relative effectiveness of a

gas to absorb infrared radiation and length of time that the gas remains in the atmosphere ("atmospheric lifetime"). The GWP of each gas is measured relative to CO_2, the most abundant GHG. The definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of "CO_2 equivalents" (CO_2e).

The following section describes the proposed project's construction and operational related GHG emissions and contribution to global climate change. The BAAQMD has not addressed emission thresholds for construction in their CEQA Guidelines; however, the BAAQMD encourages quantification and disclosure. Thus, construction emissions are discussed in this section.

Discussion

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment, based on any applicable threshold of significance?

Less Than Significant Impact. The proposed project would generate GHG emissions during both the construction and operation periods. These impacts are discussed below.

Short-Term GHG Emissions. Construction activities associated with the proposed project would produce combustion emissions from various sources. During construction, GHGs would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. Furthermore, CH_4 is emitted during the fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

The BAAQMD does not have an adopted threshold of significance for construction-related GHG emissions. Since the proposed project would expand an existing park and develop new trails and campsites, project construction impacts associated with GHG emissions would be considered less than significant.

Long-Term GHG Emissions. Long-term operation of the proposed project could generate GHG emissions from area and mobile sources. Mobile-source emitters of GHGs would include project-generated vehicle trips associated with visitor trips to the project site. Area-source emissions would be associated with activities such as landscaping and maintenance on the project site, and other sources.

As discussed above in Section III.b, the BAAQMD has developed screening criteria to provide lead agencies with a conservative indication of whether the proposed project would result in potentially significant GHG emission impacts. If all of the screening criteria are met by a proposed project, then the lead agency would not need to perform a detailed assessment of the proposed project's emissions. These screening levels are generally representative of new development without any form of mitigation measures taken into consideration. In addition, the screening criteria do not account for project

design features, attributes, or local development requirements that could also result in lower emissions.

For city park land uses, the BAAQMD screening size for operational greenhouse gas emissions is 600 acres (BAAQMD 2017). The proposed Lawson expansion of the Hood Mountain Regional Park would add 247 acres to an existing 2,195 acres of regional park space that includes trails and hike-in camping in unincorporated Sonoma County between Santa Rosa and Sonoma. The proposed project improvements would be limited to 4.2 miles of trails, four campsites, informal picnic areas, an overnight cabin, and limited infrastructure such as restrooms and signage. The total acreage for these improvements would be below the BAAQMD's screening criteria, and therefore, based on the BAAQMD's screening criteria, operation of the proposed project would result in a less-than-significant impact to GHG emissions.

b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

No Impact. As indicated above, the project would not generate significant operational or construction GHG emissions. Therefore, the proposed project would be consistent with all the applicable local plans, policies and regulations and would not conflict with the provisions of AB 32, the applicable air quality plan, or any other State or regional plan, policy or regulation of an agency adopted for the purpose of reducing GHG emissions.

The Sonoma County Community Climate Action Plan adopted in October 2008, establishes the following sectors as the major sources of GHG emissions: electricity and natural gas, transportation, agriculture, and solid waste (Sonoma County 2008). The proposed project would not generate substantial GHG emissions that would inhibit the County to reach the reduction goals for these sectors. Therefore, the proposed project would not conflict with the Climate Action Plan.

VIII. HAZARDS

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?		X		
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 1/4 mile of an existing or proposed school?				X
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
f) For a project located within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?		X		

Affected Environment

Land uses in the project area include open space and undeveloped mountainous land, the existing Hood Mountain and Sugar Loaf State Park, wineries/vineyards, and residential uses in the City of Santa Rosa.

The project site is not on a state-listed hazardous materials clean-up site. According to the State Water Resources Control Board (SWRCB) Geotracker website (SWRCB 2015) and the California Department of Toxic Substances Control (DTSC) EnviroStor website (DTSC 2007), no hazardous sites are located within 1,000 feet of the project site.

Discussion

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Potentially Significant Unless Mitigation Incorporated. Exposure to hazardous materials during the construction of the proposed project could result from the improper handling or use of hazardous substances or an inadvertent release resulting from an unforeseen event (e.g., fire, flood, or earthquake). The severity of any such exposure is dependent upon the type, amount, and characteristic of the hazardous material involved; the timing, location, and nature of the event; and the sensitivity of the individual or environment affected.

Minor amounts of fuels, motor oils, paints, and other hazardous materials would be used during construction of the proposed project. The small quantities of hazardous materials that would be transported, used, or disposed of would be well below reportable quantities. Although fuels, motor oils, and paints have hazardous properties (fuels, for example, are flammable), they would be handled in small quantities that would not create a substantial hazard for construction workers and/or the public. Compliance with federal, State, and local hazardous materials laws and regulations would minimize the risk to the public presented by these potential hazards during construction of the project. Therefore, construction of the proposed project would result in less than significant impacts related to this topic.

Operation of the proposed project (i.e., use of the trails, campsites, overnight cabin, vegetation management) would require a variety of common chemicals including

solvents, paints, pesticides, and herbicides. To minimize exposure and ensure safe use, storage and disposal of any chemicals, including common cleaning and maintenance materials, Regional Parks' staff would comply with California Code of Regulations (CCR) Title 8 General Industry Safety Orders, Control of Hazardous Substances and the Sonoma County Fire Code. In addition, implementation of the following mitigation measure would ensure that the use of pesticides and herbicides on the site would not create a significant hazard to the public or the environment.

> **Mitigation Measure HAZ-1:** Regional Parks shall avoid the use of pesticides and herbicides through the use of alternative measures such as manual or chemical removal, planting with competitive native species, or otherwise altering habitat conditions to suppress invasive, exotic species (e.g., limiting ground disturbance). If non-chemical approaches provide unsuccessful, herbicides or pesticides shall be used on a case-by-case basis. If herbicides or pesticides are used, Regional Parks shall:
>
> - Use herbicides only to spot treat high-priority infestations.
> - Conduct herbicide application under the guidance of a licensed Pest Control Advisor and Natural Resources Manager
> - Ensure that any use of pesticides or herbicides is conducted according to manufacturer recommendations.
> - Employ BMPs for staging, maintenance, fueling, and spill containment of potentially hazardous materials used on the property.
> - Use pesticides and herbicides with caution to prevent contaminated runoff, particularly for road maintenance and vegetation management activities conducted by staff or other groups.

With implementation of Mitigation Measure HAZ-1 and County, state and federal regulations related to hazardous materials, impacts related to the routine transport, use, or disposal of hazardous materials would be less than significant.

b) *Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?*

Less Than Significant Impact. Construction activities may involve the use of minor amounts of hazardous materials. However, the use of hazardous materials would be in compliance with all applicable laws and regulations. Operation of the proposed project (i.e., use of the trails, campsites, and overnight cabin) would not involve routine transport, use, or disposal of hazardous materials. Therefore, implementation of the proposed project would result in less than significant impacts related to this topic.

c) *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 1/4 mile of an existing or proposed school?*

No Impact. The project site is not located within ¼ mile of an existing or proposed school. The closest school is Austin Creek Elementary School, approximately 2.75 miles

west of the project site. Therefore, the proposed project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school.

d) *Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?*

No Impact. The project site is not included on the list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.

e) *For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?*

No Impact. The project site is not located within an airport land use plan, or within two miles of a public airport or public use airport. The closest airport to the project site is the Sonoma County Airport, approximately 14 miles northwest. Therefore, the proposed project would not expose people residing or working in the project area to excessive noise levels.

f) *For a project located within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?*

No Impact. The project site is not in the vicinity of a private airstrip. Therefore, implementation of the proposed project would not expose persons to airport-related hazards.

g) *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*

No Impact. The proposed project would expand an existing recreational facility, located in an isolated, rural area. It is not located along an identified evacuation route, nor would it affect local roadways. The proposed project would not interfere with an adopted emergency response plan or emergency evacuation plan.

h) *Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?*

Potentially Significant Unless Mitigation Incorporated. The project site is located within a moderate to very high fire hazard severity zone (Sonoma County 2008). Use of the site would increase as a result of park expansion and development of additional trails and campsites. However, implementation of the proposed project would not change the degree of exposure to wildfires, because no new housing or businesses would be constructed and existing Regional Parks' regulations prohibit smoking, motorized vehicles and open fires on park land. In addition, the MP/RMP includes monitoring of the

site for illegal activity (e.g., smoking, campfires, firearms) that might cause wildfires, as well as, establishing and maintaining fuel breaks to facilitate fire suppression.

Construction of some of the proposed improvements would occur on slopes that include grassy areas, and other potentially flammable vegetation, increasing the fire hazard risk. During construction of these improvements, the most likely source of ignition would be by mechanical activities such as operation of backhoes, mini excavators, dozers, skid steer, skid loaders, or roller compactors. However, the potential for ignition can be greatly reduced through equipment features, fuel treatment, and management of behavior. Therefore, implementation of the following mitigation measure would reduce the risk associated with fire hazards during the construction period to a less than significant level.

Mitigation Measure HAZ-2: The following measures shall be implemented throughout the construction period to reduce the potential risk associated with fire hazards:

- Regional Parks' staff shall comply with County fire prevention practices.
- Upon notification from the County Fire Department that a "Red Flag Warning – High Fire Danger Alert" exists for the County, Regional Parks shall suspend any construction activities involving powered mechanical equipment and shall limit motorized vehicle access to construction staging areas.
- Regional Parks' staff shall hold fire prevention training session(s) for construction staff, contractors, and volunteers. The training shall describe the County's fire prevention procedures and regulations for smoking and open fires on park lands, including;
  - The prohibitions on smoking and open fire or flames while on Regional Parks' land;
  - The use of fire suppression equipment; and
  - The use of avoidance measures such as not allowing heated tools to contact with ignitable fuels or not driving off road or in any area with tall grass.
- Regional Parks shall maintain fire suppression equipment, including water pumpers and fire extinguishers on site and on trucks and tractors.
- Regional Parks shall maintain communication equipment, including cell phones and radios on site during construction to allow for rapid contact of emergency responders.
- Regional Parks shall implement the following measures to reduce risk of fire resulting from the use and storage of fuel:
  - Refuel power equipment or tools in a cleared space;
  - Store fuel in a cleared space and, where possible, in the shade;
  - Turn off equipment while fueling;

- Use a gas spout/funnel to avoid spills; and
- Remove or dry any spilled fuel prior to starting equipment

With implementation of this mitigation measure, the proposed project would result in a less than significant impact related to exposing people or structures to a significant risk of loss, injury or death involving wildland fires.

IX. HYDROLOGY AND WATER QUALITY

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?			X	
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?			X	
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?			X	
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			X	
f) Otherwise substantially degrade water quality?			X	
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				X

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding of as a result of the failure of a levee or dam?				X
j) Inundation by seiche, tsunami, or mudflow?			X	

Affected Environment

The project site is located within the Russian River Watershed within the Santa Rosa Creek and Mark West Creek sub-watersheds. The Santa Rosa Creek sub-watershed drains an area of approximately 81 square miles. Major tributaries in the sub-watershed include Santa Rosa Creek, Spring Creek, Brush Creek, Matanzas Creek, Colgan Creek, and Rincon Creek. The Mark West Creek sub-watershed drains an area of approximately 83 square miles. Major tributaries in the sub-watershed include Mark West Creek, a tributary of the Russian River, Windsor Creek, Porter Creek, Wright Creek, Mill Creek, and Van Buren Creek. Surface waters in the project area include Azalea Creek, which flows through the northeast corner of the project site, and two unnamed streams that flow through the western portion of the project site. Santa Rosa Creek is located approximately 0.7 mile north of the project site. North Fork Hood Creek is located just south of the project site and is a tributary to Hood Creek, which flows along the west side of Pythian Road. Hood Creek is tributary to Sonoma Creek which is located approximately 2.8 miles south of the project site.

The California Regional Water Quality Control Board (RWQCB) is responsible for protecting surface, ground, and coastal waters within its boundaries, pursuant to the Porter-Cologne Water Quality Control Act of the California Water Code. The RWQCB can issue a National Pollution Discharge Elimination System (NPDES) permit for applicable activities. The project site is within the boundaries of the North Coast RWQCB.

According to the State Water Resources Control Board (SWRCB) 2012 Integrated Report (CWA Section 303(d) List), Azalea Creek is not listed for any impairments. Santa Rosa Creek (mainstream) is listed as impaired for indicator bacteria, sedimentation/siltation, and water temperature. Tributaries to Santa Rosa Creek are listed as impaired for indicator bacteria, mercury, sedimentation/siltation, and water temperature. Sonoma Creek is within the boundaries of San Francisco Bay RWQCB and is listed as impaired for nutrients, pathogens, and sedimentation/siltation.

The project site is not located within the boundaries of a groundwater basin. The nearest groundwater basin is the Kenwood Valley Groundwater Basin located southwest of the project site.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Nos. 06097C0752E and 06097C0745E (December 2, 2008), the project site is located outside of the 100-year and 500-year floodplain. Areas of Sonoma County would be subject to flooding associated with potential failure of dams located throughout the County. However, the project site is located outside the dam failure inundation areas (Sonoma County 2008).

The recent fires in Sonoma County burned over 50 percent of the Hood Mountain Regional Park and Open Space Preserve, and left a patchwork of burned areas within the Lawson Expansion, covering approximately 1/3 of the project site. In addition, fire suppression activities were utilized on the site, including clearing of grassland areas, bulldozing a fire line and cutting hand lines around the safety zone on Lawson Peak. Typically, burned areas have higher rates of stormwater runoff due to the lack of vegetation and inability of the soils to absorb rainfall. To minimize these effects, Regional Parks has already re-seeded cleared areas, and as of spring 2018, many of these areas are revegetated with native grasses. Regional Parks has been monitoring the site for potential erosion hazards associated with increased stormwater runoff, and will continue to do so with implementation of the MP/RMP.

Discussion

a) Violate any water quality standards or waste discharge requirements?

Less Than Significant Impact. The proposed project would not violate water quality standards or discharge requirements. However, the proposed project could potentially result in short-term (construction) water quality impacts.

Construction-Related Impacts. Pollutants of concern during construction include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. Each of these pollutants on its own or in combination with other pollutants can have a detrimental effect on water quality. During construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion and sedimentation compared to existing conditions. In addition, chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), and concrete-related waste may be spilled or leaked and have the potential to be transported via storm runoff into receiving waters. Construction of proposed improvements would disturb approximately 2.7 acres in total. However, construction of proposed improvements would be phased. If construction of any of the proposed improvements would disturb greater than 1 ac of soil, the project is subject to the requirements of the SWRCB's NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ, NPDES No. CAS000002, as amended by Orders No. 2010-0014-DWQ and 2012-0006-DWQ) (Construction General Permit).

Under the Construction General Permit, the Construction Contractor would be required to prepare a Storm Water Pollution Prevention Plan (SWPPP) and implement construction BMPs detailed in the SWPPP during construction activities. Construction BMPs would include, but not be limited to, erosion and sediment control, designed to minimize erosion and retain sediment on site, and good housekeeping practices to prevent spills, leaks, and discharge of construction debris and waste into receiving waters.

In addition, as described in Section VI, Geology and Soils, the MP/RMP specifies that Regional Parks will maintain proposed improvements, identify and evaluate erosion areas, and identify and implement specific BMPs in the design, construction, and maintenance of trails and other improvements to control erosion and sediment (REC-1.5, MAINT-1.3 and MAINT-1.4). In addition, all construction activities would follow the Sonoma County Permit and Resource Management Department's Erosion Prevention and Sediment Control Practices for Effective Construction Site Management. Further, Mitigation Measure HAZ-1, identified in Section VIII, Hazards, requires that Regional Parks employ BMPs including spill containment of potentially hazardous materials.

Implementation of MP/RMP policies, mitigation measures identified in this Initial Study, and adherence to County, and state requirements would ensure that construction of the proposed project would result in a less than significant impact associated with the violation of water quality standards or waste discharge requirements.

As discussed under Section IV, Biological Resources, several drainages are present on the project site that may be under the jurisdiction of the Corps, CDFW, and/or RWQCB. These drainages may be impacted by improvements, particularly new trail construction and maintenance and improvement of existing trails where those improvements are located adjacent to or across drainages. However, implementation of MP/RMP goals and guidelines would ensure that the locations for any of these facilities would be carefully chosen so as to minimize impacts to drainages. Additionally, permits from the Corps, RWQCB and CDFW may be required.

Long-Term Operational Impacts. The Lawson expansion project could increase pollutants of concern typical of recreational facilities including suspended solids/sediments, nutrients, pathogens (bacteria/viruses), and trash and debris. Runoff and increased sedimentation in stormwater runoff could increase erosion. Pedestrians and equestrians utilizing the trail would be a potential source of trash and pathogens (e.g., fecal matter). However, as a trail project, the proposed project would not create or replace 1 ac or more of impervious surface area. Therefore, the proposed project would not be subject to the requirements of the Waste Discharge Requirements (WDR) for Storm Water and Non-Storm Water Discharges from Municipal Separate Storm Sewer Systems (MS4) Permit (Order No. R1-2009-0050; NPDES No. CA0025054) (Sonoma County Phase II MS4 Permit). The Lawson property is within the boundary of the Sonoma County Phase II MS4 Permit, which covers the County of Sonoma and unincorporated areas near the cities of Healdsburg, Windsor, Santa Rosa, Rohnert Park, Cotati and Sebastopol. The permit requires all new development projects creating or replacing a combined total of 1 acre or more of impervious surface to implement post-construction treatment controls to mitigate all project-related storm water pollution. As a trail project, the proposed project would not substantially alter on-site hydrology; stormwater runoff would continue to infiltrate into the ground, maintaining the existing drainage pattern to the maximum extent practicable. Therefore, the proposed project would result in a less than significant impact associated with the violation of water quality standards or waste discharge requirements during operation.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the

local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

No Impact. The project site is not located within a groundwater basin. In addition, the proposed project would not result in the construction of large areas of impervious surfaces that would prevent water from infiltrating into the groundwater nor would it result in direct additions or withdrawals to existing groundwater. Therefore, the proposed project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge.

c) *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?*

Less Than Significant Impact. During construction activities, soil would be exposed and disturbed, drainage patterns would be temporarily altered during grading and other construction activities, and there would be an increased potential for soil erosion and siltation compared to existing conditions. Additionally, during a storm event, soil erosion could occur at an accelerated rate. As discussed above in Response IX (a), the Construction General Permit requires preparation of a SWPPP and implementation of construction BMPs to reduce impacts to water quality during construction, including those impacts associated with soil erosion and siltation to less than significant levels.

Proposed improvements primarily consist of pervious surfaces (e.g., trails). A nominal amount of impervious surfaces (i.e. less than 1 acre) would be developed associated with the bunkhouse and restroom on site; however, the amount of impervious surface developed under the proposed project would not be substantial and would be similar to the existing condition as the proposed bunkhouse would be constructed within the footprint of the existing residence on the site. Therefore, the volume and velocity of stormwater runoff on the project site would be similar to the existing condition. The trails would be outsloped and the camping sites would be sloped so stormwater runoff could drain across the site and runoff would not concentrate in pools. Stormwater runoff from the bunkhouse and restroom would travel through downspouts and be directed to a water dissipater, which would direct stormwater runoff to drain across the site so runoff would not concentrate in pools. Stormwater runoff would continue to infiltrate into the ground, maintaining the existing drainage pattern to the maximum extent practicable and minimizing any stormwater runoff that might result in substantial erosion or siltation on- or off-site. A less than significant impact would occur.

d) *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?*

Less Than Significant Impact. Construction activities would temporarily alter on-site drainage patterns and compact soil, which can increase the volume and velocity of storm water runoff. However, construction activities would be temporary, and the increase in runoff would not be substantial. As discussed in Response IX (a) above, the

Construction General Permit requires the preparation of a SWPPP to identify construction BMPs to be implemented as part of the proposed project to reduce impacts to water quality during construction, including those impacts associated with flooding. Therefore, implementation of construction BMPs would ensure that construction activities would result in a less than significant impact related to altering the existing drainage pattern of the site or area or increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.

Proposed improvements primarily consist of pervious surfaces (e.g., trails). A nominal amount of impervious surfaces (i.e. less than 1 acre) would be developed associated with the bunkhouse and restroom on site; however, the amount of impervious surface developed under the proposed project would not be substantial and would be similar to the existing condition. Therefore, the volume and velocity of stormwater runoff on the project site would be similar to the existing condition. The trails would be outsloped and the camping sites would be sloped so stormwater runoff could drain across the site so runoff would not concentrate in pools. Stormwater runoff from the bunkhouse and restroom would travel through downspouts and be directed to a water dissipater device which would direct stormwater runoff to drain across the site so runoff would not concentrate in pools. Stormwater runoff would continue to infiltrate into the ground, maintaining the existing drainage pattern to the maximum extent practicable and minimizing any stormwater runoff that might result in flooding on- or off-site. A less than significant impact would occur.

e) *Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?*

Less Than Significant Impact. See Response IX(d).

f) *Otherwise substantially degrade water quality?*

Less Than Significant Impact. See Response IX(a).

g) *Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?*

No Impact. Implementation of the proposed MP/RMP would include construction of an overnight cabin for park users. As described above, the project site is located outside of the 100-year and 500-year floodplain. Therefore, the proposed project would not place housing within a 100-year flood hazard area.

h) *Place within a 100-year flood hazard area structures which would impede or redirect flood flows?*

No Impact. As described above, the project site is not located within a FEMA 100-year flood zone. The proposed project does not include the construction of any structures that could impede or redirect flows. Therefore, implementation of the proposed project would not place any structures within a 100-year flood hazard area.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding of as a result of the failure of a levee or dam?

No Impact. The proposed project site is not located in the inundation area for any levee or dam in the project vicinity (Sonoma County 2008) nor is it located within a 100-year flood hazard zone. Therefore, the proposed project would not expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

j) Inundation by seiche, tsunami, or mudflow?

Less Than Significant Impact. Seiches are caused when earthquake ground motions cause water to oscillate from one side to the other of a closed or partially closed body of water such as a lake, bay or reservoir. Such waves can result in damage to structures along the edges of these water bodies. Shoreline areas along Bodega Harbor, Lake Sonoma and similar enclosed bodies of water in Sonoma County are subject to impacts from seiches. As the proposed project is not located along one of these enclosed bodies of water; the proposed project would not be subject to inundation by seiche.

Tsunamis, or seismic tidal waves, are caused by off-shore earthquakes that can trigger large, destructive sea waves. The project site is not located within a tsunami inundation area (California Emergency Management Agency, University of Southern California and the California Geological Survey 2016). Therefore, there is no risk of inundation by tsunami.

Mudflows typically occur in mountainous or hilly terrain. Areas of the project site with relatively steep slopes would be susceptible to mudflows that could potentially affect the new improvements. Maintenance of the trails would be required as outlined in the MP/RMP to reduce potential effects from mudflows. Therefore, a less than significant risk related to mudflows would occur.

X. LAND USE AND PLANNING

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?				X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?			X	
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

Affected Environment

The project site is located within an unincorporated area of Sonoma County east of the City of Santa Rosa. The project site is a 247-acre parcel of open space that includes grasslands, oak woodlands, mixed evergreen forest and chaparral. The 247-acre Lawson Expansion will be added to the existing Hood Mountain. The project site is surrounded to the north, east, and south by undeveloped mountainous land. The existing Hood Mountain borders the project site to the east, southeast and northeast. Private land borders the project site to the north and west. Residential uses within the City of Santa Rosa are located further west and south of the project site and Sugar Loaf State Park is located further north and east beyond Hood Mountain. The development of Oakmont Village and various wineries/vineyards are located to the south along State Highway 12.

The project site is located within unincorporated Sonoma County and is subject to the land use and zoning designations of the Sonoma County General Plan 2020 (Sonoma County 2008) and relevant portions of the Sonoma County Code Zoning Regulations Chapter 26 (Sonoma County 2014). Sonoma County designates the site as Resources and Rural Development (RRD). The RRD designation is intended to allow residences at very low densities due to lack of infrastructure, greater distance from public services, poor access, conflicts with resource conservation and production, and significant physical constraints and hazards. The intent is for natural resource areas to be managed and conserved. Permitted uses include resource management and enhancement activities including but not limited to lodging and campgrounds.

The project site is zoned for RRD and is also located in a Biotic Habitat Riparian Corridors Combining Zone in the Sonoma County Zoning Code. The purpose of the RRD zoning designation is to allow very low density residential development and recreational and visitor-

serving uses where compatible with resource use and available public services. In addition, the RRD zoning designation provides protection of lands containing natural resources. The Biotic Habitat Zone is established to protect and enhance the natural habitat and environmental values of biotic habitat areas. Protection of these areas helps to maintain the natural vegetation, support native plant and animal species, protect water quality and air quality, and preserve the quality of life, diversity, and unique character of the County. The Riparian Corridor Zone is established to protect biotic resource communities, including critical habitat areas within and along riparian corridors for their habitat and environmental value (Sonoma County Permit and Resource Management Department 2016).

Discussion

a) Physically divide an established community?

No Impact. The physical division of an established community typically refers to the construction of a physical feature (such as an interstate highway or railroad tracks) or removal of a means of access (such as a local road or bridge) that would impair mobility within an existing community, or between a community and outlying areas. The proposed project would add approximately 247 acres to an existing regional park. Therefore, the proposed project would not physically divide an established community.

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Less Than Significant Impact. The project site has a land use designation of RRD in the Sonoma County General Plan. The Sonoma County Zoning Code specifies that the project site is zoned RRD with Biotic Habitat Riparian Corridors Combing Zone. The proposed project would expand an existing park and develop additional trails and campsites for recreational use, which is permitted under the County's zoning ordinance with a Use Permit.

According to the County's Active Map Viewer (Sonoma County 2018), several creeks on the project site, including Badger Creek, Lost Creek and Azalea Creek, are designated riparian areas (RC-50). The RC combining zone is applied to designated streams and includes the stream bed and bank and an adjacent streamside conservation area on each side of the stream as measured from the top of the higher bank. The designation RC-50 indicates that the minimum streamside conservation area for these streams is 50 feet. The Sonoma County Zoning Code specifies that bikeways, trails, and parks on publicly owned land are an allowable use within the RC district, subject to a zoning permit. As described in Section IV, Biological Resources, construction or placement of trails and other facilities could result in the removal of small amounts of sensitive habitat. However, implementation of MP/RMP goals and guidelines would ensure that the locations for any of these facilities would be carefully chosen so as to minimize impacts to sensitive habitats. Minimal impacts associated with development of proposed facilities would be outweighed by the benefits to native habitats resulting from implementation of the proposed project, e.g., through enhancement of native vegetation, removal of some trails, and trail maintenance and management.

The proposed project would contribute to implementing the County's General Plan 2020 (2008) goals and policies related to the provision of outdoor recreation facilities and protection of natural resources, water quality, cultural resources, and visual resources. Additionally, implementation of MP/RMP goals and guidelines would ensure protection of natural resources and compliance with the County's General Plan. This impact would be less than significant.

c) *Conflict with any applicable habitat conservation plan or natural community conservation plan?*

No Impact. The project site is not located within the boundaries of an adopted Habitat Conservation Plan or Natural Community Conservation Plan. Therefore, implementation of the proposed project would not conflict with any applicable Habitat Conservation Plan or Natural Community Conservation Plan in Sonoma County. No impact would occur.

XI. MINERAL RESOURCES

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?				X
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X

Affected Environment

Minerals are any naturally occurring chemical element or compound, or groups of elements and compounds, formed from inorganic processes and organic substances including, but not limited to, coal, peat and oil bearing rock, but excluding geothermal resources, natural gas and petroleum. Rock, sand, gravel and earth are also considered minerals by the Department of Conservation when extracted by surface mining operations. The project site is not located in a designated mineral resource area (Sonoma County Permit and Resource Management Department 2016).

Discussion

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?

No Impact. No known mineral resources are located on or near the project site. Therefore, the proposed project would not result in the loss of availability of a known mineral resource.

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No Impact. See XI(a), above.

XII. NOISE

Would the project result in:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?			X	
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

Affected Environment

Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, or sleep. Several noise measurement scales exist that are used to describe noise in a particular location. A *decibel* (dB) is a unit of measurement that indicates the relative intensity of a sound. The 0 point on the dB scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Changes of 3.0 dB or less are only perceptible in laboratory environments. Audible increases in noise levels generally refer to a change of 3.0 dB or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. Sound levels in dB are calculated on a logarithmic

basis. An increase of 10 dB represents a 10-fold increase in acoustic energy, while 20 dB is 100 times more intense, and 30 dB is 1,000 times more intense. Each 10 dB increase in sound level is perceived as approximately a doubling of loudness. Sound intensity is normally measured through the *A-weighted sound level* (dBA). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. The A-weighted sound level is the basis for 24-hour sound measurements which better represent how humans are more sensitive to sound at night.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq}, the community noise equivalent level (CNEL), and the day-night average level (L_{dn}) based on A-weighted decibels (dBA). CNEL is the time varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale, but without the adjustment for events occurring during the evening relaxation hours. CNEL and L_{dn} are within one dBA of each other and are normally interchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

A project would have a significant noise effect if it would substantially increase the ambient noise levels for adjoining areas or conflict with adopted environmental plans and goals of applicable regulatory agencies, including, as appropriate, Sonoma County.

The Sonoma County General Plan 2020 addresses noise in the Noise Element (Sonoma County 2012). Major noise sources in Sonoma County include transportation, industrial facilities noise, recreational entertainment and special events noise, and other stationary sources. The Noise Element also provides goals, objectives, and policies to protect the County from excessive noise levels. The Noise Element also sets maximum allowable exterior noise exposures for non-transportation noise sources, as shown in Table 2, below.

Table 2: Maximum Allowable Exterior Noise Exposures for Non-transportation Noise Sources

Hourly Noise Metric, dBA	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
L_{50} (30 minutes in any hour)	50	45
L_{25} (15 minutes in any hour)	55	50
L_{08} (4 minutes 48 seconds in any hour)	60	55
L_{02} (72 seconds in any hour)	65	60

Source: Sonoma County, 2012.

As outlined in the project description, the project site is surrounded to the north, east, and south by undeveloped mountainous land. Hood Mountain borders the project site to the east, southeast and northeast. Private land borders the project site to the north and west. Residential uses within the City of Santa Rosa are located further west and south of the project site and are well over 1,000 feet from the project site.

Discussion

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less Than Significant Impact. The long-term operational and short-term construction noise impacts of the proposed project are described below.

Short-Term (Construction) Impacts. The General Plan does not provide construction noise guidelines; however, short-term noise impacts would occur during demolition, grading and site preparation activities. Construction-related short-term noise levels would be higher than existing ambient noise levels currently in the project area but would no longer occur once construction of the project is completed.

The nearest noise sensitive receptors are located well over 1,000 feet from the project site. Typical maximum noise levels range up to 91 dBA L_{max} at 50 feet during the noisiest construction phases. Based on noise attenuation due to distance, noise levels during construction would be reduced to noise levels of 65 dBA L_{max}. This noise level would be consistent with the existing traffic noise levels and would not substantially affect sensitive land uses. As identified above, the General Plan does not provide construction noise guidelines; therefore, construction noise levels would not exceed any significance threshold. This impact would be considered less than significant.

Long-Term Operational Impacts. As identified in the Traffic Study (W-Trans 2017) prepared for the proposed project, the proposed project would generate approximately 25 daily trips on weekdays and 67 daily trips on weekends. These trips would be considered minimal when averaged over a 24-hour period. Additionally, sensitive receptors are not located adjacent to the park. Therefore, implementation of the proposed project would not result in a substantial increase in daily traffic trips in the project area; consequently, the proposed project would not result in substantial traffic noise effects on adjacent land uses. Hood Mountain Regional Park and Open Space Preserve is an existing open space use and park visitors would generate noise intermittently while using the proposed project, but would not generate noise levels that would exceed the applicable standards. Therefore, the proposed project would not expose persons to noise levels in excess of local standards.

b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?

Less Than Significant Impact. Common sources of ground borne vibration and noise include trains and construction activities such as blasting, pile driving and operating heavy earthmoving equipment. Construction of the proposed project would involve demolition, site preparation, and construction activities but would not involve the use of construction equipment that would result in substantial ground-borne vibration or ground-borne noise on properties adjacent to the project site. No pile driving, blasting, or significant grading activities are proposed. Furthermore, operation of the proposed project would not generate substantial ground-borne noise and vibration. Therefore, the project would not result in the exposure of persons to or generation of excessive ground-

borne noise and vibration. Impacts related to ground borne vibration are considered less than significant, and no mitigation is required.

c) *A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?*

Less Than Significant Impact. The long-term use of the project would expand an existing park and develop new multi-use trails and campsites. As discussed in Section XII.a, above, this land use would not generate increased ambient noise levels. No substantial long-term increase in ambient noise levels is expected as a result of project implementation.

d) *A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?*

Less Than Significant Impact. Construction of the proposed project would temporarily elevate noise above ambient noise levels; however, construction noise is not regulated by Sonoma County and would not be significant. Due to the existing noise environment, implementation of the proposed project would not result in a perceptible increase in ambient noise levels at the nearest off-site sensitive receptors. This impact would be less than significant.

e) *For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?*

No Impact. The project site is not located within an airport land use plan, or within two miles of a public airport or public use airport. The closest airport to the project site is the Sonoma Valley Airport, approximately 9 miles northwest. Therefore, the proposed project would not expose people residing or working in the project area to excessive noise levels.

f) *For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?*

No Impact. The proposed project is not located within the vicinity of a private airstrip.

XIII. POPULATION AND HOUSING

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

Affected Environment

The project site consists of undeveloped mountainous land directly adjacent to the Hood Mountain Regional Park and Open Space Preserve. The project site is surrounded to the north, east, and south by undeveloped mountainous land. Residential uses within the City of Santa Rosa are located to the west of the project site.

Discussion

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No Impact. The proposed project would improve the project site as part of the Hood Mountain Regional Park and Open Space Preserve. No new housing, commercial or industrial space would be developed as part of the proposed project. The proposed project would not result in the conversion of adjacent land uses or provide additional major infrastructure. Therefore, the proposed project would not directly or indirectly induce substantial population growth.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

No Impact. The proposed project would be located within an existing undeveloped site. Two abandoned structures are located on the site, a residence and a dilapidated barn, both of which are not currently used for housing. Therefore, the proposed project would

not displace existing housing that would necessitate the construction of replacement housing elsewhere.

c) *Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?*

No Impact. See XIII(b), above.

XIV. PUBLIC SERVICES

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:	**Potentially Significant Impact**	**Potentially Significant Unless Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
Fire protection?			X	
Police protection?			X	
Schools?				X
Parks?			X	
Other public facilities?				X

Affected Environment

The project site is located in unincorporated Sonoma County served by the following existing public services.

Fire Protection. Fire protection and emergency response services in Sonoma County is provided by a number of different agencies, including city fire departments, independent districts, and volunteer fire companies. Additional fire protection services in the unincorporated parts of the county are provided by the California Department of Forestry and Fire Protection (CDF) (County Service Area #40). CDF is responsible for fire prevention and code enforcement services to enforce the California Fire Code and other fire-related codes and ordinances (Sonoma County 2008).

Police Protection. Police protection is provided by the Sonoma County Sheriff's Office, which is comprised of a total of approximately 650 employees with140 Deputy Sheriffs in the Patrol Bureau. The Sheriff's Office has divided the County into six law enforcement zones. The project site is located in law enforcement Zone 3, which includes approximately 104 square miles of unincorporated areas surrounding the city of Santa Rosa Sonoma County Sherriff's Office 2015). The Sonoma County Sherriff's Main Office is located at 2796 Ventura Avenue in Santa Rosa.

Schools. Sonoma County is divided into 40 school districts for kindergarten through twelfth-grade educational services. There are 31 elementary, 3 high school, and 6 unified districts that serve approximately 71,000 students (Sonoma County Office of Education 2017).

Parks. For a discussion of parks, see Section XV. Recreation.

Discussion

a) *Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: Fire protection, police protection, schools, parks, other public facilities?*

Fire Protection. **Less Than Significant Impact.** Implementation of the proposed project would expand the existing Hood Mountain Regional Park and Open Space Preserve. Use of the site would increase as a result of the development of additional trails and campsites. However, because the proposed improvements would be for recreation and would not include housing units or other structures, the incremental increase in demand for fire protection services would not be significant and would not exceed the physical and financial capabilities of the Fire Department, resulting in the need for new or expanded fire services. Therefore, impacts to fire protection would be less than significant.

Police Protection. **Less Than Significant Impact.** Implementation of the proposed project would expand the existing Hood Mountain Regional Park and Open Space Preserve. Use of the site would increase as a result of the development of additional trails and campsites. However, because the proposed improvements would be for recreation and would not include housing units or other structures, the incremental increase in demand for police protection services would not be significant and would not exceed the physical and financial capabilities of the Sherriff's Office, resulting in the need for new or expanded police protection services. Therefore, impacts to fire protection would be less than significant.

Schools. **No Impact.** Implementation of the proposed project would not result in any local or regional population increase. Therefore, the project would not require construction of new schools, or result in schools exceeding their capacities.

Parks. **Less Than Significant Impact.** Implementation of the proposed project would expand the existing Hood Mountain Regional Park and Open Space Preserve to serve recreationalists in the area. Therefore, the proposed project would not result in substantial adverse physical impacts associated with new parks or the need for new parks, which could cause environmental impacts.

Other Public Facilities. **No Impact.** The proposed project would expand the existing regional park. Because it would not result in any local or regional population increase, it would not result in substantial adverse physical impacts associated with the provision of other public facilities.

XV. RECREATION

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?			X	
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?		X		

Affected Environment

The Sonoma County Regional Parks system includes more than 50 parks, trails, and beaches from Petaluma to Gualala and Sonoma to Bodega Bay (Sonoma County Regional Parks 2017). The project site is owned by the Sonoma County Regional Parks. The project site consists of open space and is located adjacent to the existing Hood Mountain Regional Park and Open Space Preserve. The proposed project would expand Hood Mountain Regional Park and Open Space Preserve by 247 acres and include additional trails and campsites for recreational purposes.

Discussion

a) *Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?*

Less Than Significant Impact. Implementation of the proposed project would expand an existing park. Use on the site would increase as a result of the development of additional trails and campsites. However, implementation of the proposed project is not expected to result in an increase of use that would result in substantial physical deterioration of existing facilities or accelerate physical deterioration of existing facilities. Therefore, this impact is considered less than significant.

b) *Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?*

Potentially Significant Unless Mitigation Incorporated. The proposed project would improve the project site for recreational use and expand the existing Hood Mountain Regional Park and Open Space Preserve. The intent of the MP/RMP process was to minimize adverse physical effects on the environment. Potential adverse effects on the

environment related to the development of the project identified in the MP/RMP have been evaluated in this Initial Study. Implementation of the mitigation measures contained in this Initial Study would reduce potential impacts to less than significant.

XVI. TRANSPORTATION/TRAFFIC

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?			X	
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?			X	
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e) Result in inadequate emergency access?			X	
f) Conflict with adopted polices, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?			X	

W-Trans prepared a Focused Traffic Study (W-Trans 2017) to study the potential traffic impacts of the expansion on the study area that provides access to the project site, as well as assess facilities for alternative modes. The following discussion is summarized from that report.

Affected Environment

Hood Mountain Regional Park and Open Space Preserve is an existing 2,195-acre regional park and open space preserve that includes trail and hike-in camping in unincorporated Sonoma County near Eastern Santa Rosa with access via Pythian Road and Los Alamos Road, which both connect to State Route 12 (SR 12). The proposed project would add approximately 247 acres to the existing park.

Existing Conditions. The traffic study evaluated the weekday AM and PM and weekend midday peak periods for the following intersections:

- **SR12/Los Alamos Road** is a four-legged signalized intersection with protected left-turn phasing on the eastbound and westbound SR12 approaches ad permitted left-turn phasing on the northbound and southbound approaches. Marked crosswalks are provided on the north, south and west legs.
- **SR 12/Pythian Road** is also a signalized intersection with four legs. The eastbound and westbound approaches have protected left-turn phasing while the northbound and southbound approaches have permitted left-turn phasing Crosswalks are located on the north and east legs of this intersection.
- **Los Alamos Road** north of SR12 has a posted speed limit of 35 miles per hour (mph). Approximately 3.7 miles north of SR12, the road becomes a one-lane road with advisory speeds posted at 10 mph in advance of curves.
- **Pythian Road** is a two-lane road at its intersection with SR12. The road narrows to one lane with advisory speed signs of 15 mph approximately 0.9 mile north of SR12, with one lane in each direction and no shoulders.

Traffic counts for SR12/Los Alamos Road were obtained August 2, 2016 for the weekday peak periods and April 1, 2017 for the weekend midday peak hour. At SR12/Pythian Road, data was collected on September 23, 2014 for the weekday AM peak hour, March 30, 2017 for the weekday PM peak hour, and April 1, 2017 for the weekend midday peak hour. Since weekday AM peak hour traffic counts are older than two years, a growth factor was derived from historic SR12 segment volumes and applied to the volumes to arrive at 2017 volumes. Signal timing acquired from Caltrans was applied to the analysis. Under these existing volumes and controls, the intersections are operating at LOS B overall. The results are shown in Table 3.

Table 3: Existing Peak Hour Intersection Levels of Service

	AM Peak Hour		PM Peak Hour		Weekend MD Peak Hour	
Study Intersections	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
SR12/Los Alamos Road	11.7	B	13.4	B	12.1	B
SR12/Pythian Road	15.2	B	13.5	B	14.0	B

Source: W-Trans, 2017

Future Conditions. The traffic study also evaluated the future volumes for year 2040 to account for regional growth in the area as well as infill development between 2017 and 2040. Under these projected future volumes, the intersections are expected to operate at LOS B overall as shown in Table 4.

Table 4: Future Peak Hour Intersection Levels of Service

	AM Peak Hour		PM Peak Hour		Weekend MD Peak Hour	
Study Intersections	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
SR12/Los Alamos Road	12.5	B	14.3	B	13.1	B
SR12/Pythian Road	18.6	B	16.4	B	15.6	B

Source: W-Trans, 2017

Pedestrian Facilities. Pedestrian facilities generally include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities, such as lighting, benches, etc. In the study area, marked crosswalks are located at the SR 12/Los Alamos Road and SR 12/Pythian Road intersections; however, sidewalk gaps, obstacles, and barriers can be found along the roadways connecting to the project site. Overall, existing pedestrian facilities are consistent with the rural nature of the project area.

Bicycle Facilities. Class II bike lanes are proposed on SR 12 between Farmers Lane and Kunde Winery Road. Developments that front SR 12 will have to dedicate right-of-way, as necessary, so that it will be available when the bike lanes are built. Currently, more experienced cyclists ride on the shoulder of SR 12. These proposed facilities will provide adequate access for bicyclists.

Short-term bicycle parking is provided at the project site by bike racks, which are located at the Pythian Road parking lot. No bike parking is provided at the Los Alamos Road parking lot.

Parking. The County of Sonoma Municipal Code does not provide parking requirements for parks; however, the project was analyzed to determine whether the existing parking supply would be sufficient for the anticipated parking demand. A total of 50 parking spaces are provided in the Los Alamos parking lot, 25 spaces at the Pythian Road parking lot, 80 overflow spaces in the Pythian overflow area, and the Pythian equestrian area can accommodate at least six trucks plus horse trailers for a total of 161 parking spaces.

Data from Sonoma County Parks indicates 41,000 visitors at Hood Mountain Regional Park and Open Space Preserve per year, equating to 112 visitors daily. Assuming one visitor per vehicle, 112 vehicles would require parking over the course of a day. The Lawson Expansion is 11 percent of the existing park size. Assuming an 11 percent increase in parking demand, there would be a demand for 124 parking spaces per day with implementation of the proposed project. Based on annual visitation, the parking supply would be adequate for existing and proposed demand.

Discussion

a) *Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?*

Less Than Significant Impact. The proposed project would expand the existing regional park and open space preserve by 247 acres. The project would replace currently undeveloped land that may be subject to passive recreation use by nearby residents.

Trip Generation. W-Trans examined several sources to find appropriate trip generation rates to apply for this project. The anticipated trip generation for the proposed project is generally estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual,* 9th Edition, 2012. This publication includes information for a County Park (ITE LU #412) and a State Park (ITE LU #413), which would be the closest land use categories to the proposed Lawson Expansion; however, these rates would generally overestimate the expected volume of traffic since they are based on surveys of parks with more active facilities such as sporting events with soccer fields, baseball fields, and a lake with launch ramps for boating.

Due to limitations of this data, surveys were previously collected at a trailhead parking lot for Shell Beach off of SR 1, south of SR 116. This lot serves as access to trailheads on both sides of SR 1 covering an estimated 800 acres. The data collected indicated that the Shell Beach parking lot generates traffic at a rate of 0.02 trips/acre of trail during a weekday PM peak hour and at 0.04 trips/acre of trail during a Saturday midday peak hour. This data has been used to determine vehicle trip generation rates for similar park trail facilities throughout Sonoma County. For more information on how the trip generation for the proposed project was calculated, please refer to the Focused Traffic Study (W-Trans 2017) provided in Appendix A.

The trip generation summary for both the existing park acreage and the proposed Lawson Expansion are shown below in Table 5. The Lawson Expansion is expected to generate 25 weekday daily trips, including 5 trips during the PM peak hour and 67 weekend vehicle trips, including 10 peak hour trips.

Table 5: Trip Generation Summary

	Weekday Daily		AM Peak Hour 8:00 AM-9:00 AM				PM Peak Hour 4:00 PM-5:00 PM				Weekend Daily		Weekend Peak Hour 12:00 PM-1:00 PM			
Acres	Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out	Rate	Trips	Rate	Trips	In	Out
2,195.41	*0.10*	*220*	*0.02*	*44*	*22*	*22*	*0.02*	*44*	*22*	*22*	*0.27*	*593*	*0.04*	*88*	*44*	*44*
247.26	0.10	25	0.02	5	3	2	0.02	5	3	2	0.27	67	0.04	10	5	5

Source: W-Trans, 2017
Note: Italics represent existing rates and volumes; regular font represents proposed rates and volumes.

Existing Plus Project Conditions. Upon the addition of project-related traffic to the Existing Volumes, the study area intersections are expected to operate acceptably at the same levels of service as without the project, as shown in Table 6.

Table 6: Existing Plus Project Peak Hour Intersection Levels of Service

	AM Peak Hour		PM Peak Hour		Weekend MD Peak Hour	
Study Intersections	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
SR12/Los Alamos Road	11.7	B	13.5	B	12.2	B
SR12/Pythian Road	15.3	B	13.4	B	14.1	B

Source: W-Trans, 2017

Future Plus Project Conditions. The study area intersections are expected to operate acceptably at the same levels of service as without the project when project-related trips are added to the Future Volumes, as shown in Table 7.

Table 7: Future Plus Project Peak Hour Intersection Levels of Service

	AM Peak Hour		PM Peak Hour		Weekend MD Peak Hour	
Study Intersections	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
SR12/Los Alamos Road	12.6	B	14.3	B	13.2	B
SR12/Pythian Road	18.7	B	16.3	B	15.7	B

Source: W-Trans, 2017

A small increase in traffic would occur in the project area during the construction phase of the proposed project from construction vehicles and construction workers accessing the site. However, these impacts would be short-term, occurring only during the construction period.

For the reasons outlined above, the proposed project would not conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system. This impact would be less than significant.

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Less Than Significant Impact. As described above, the proposed project is anticipated to generate 25 additional daily trips, including five additional trips each during the AM and PM peak hours. On weekends, the Lawson Expansion is expected to generate 67 additional daily trips, including ten trips during the weekend midday peak hour. Study area intersections are currently operating at LOS B and will continue to operate at LOS B under Future conditions, with project-generated trips added. Use of construction vehicles and equipment during project construction would result in a minor, temporary increase in vehicle traffic in the area around the project site. However, construction activities would be temporary and are not expected to conflict with an applicable congestion management program. This impact would be less than significant.

c) *Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?*

No Impact. The proposed project is a park expansion project and would not result in any changes in air traffic patterns or levels of air traffic.

d) *Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?*

No Impact. The proposed project would not create new intersections or driveways. Parking for the proposed project would occur within the existing parking lots on Pythian Road and Los Alamos Road. The existing roadways being used to serve the proposed project have not been found to be hazardous. Therefore, the proposed project would not substantially increase hazards due to a design feature or incompatible use.

e) *Result in inadequate emergency access?*

Less Than Significant Impact. The project does not propose to construct new roadways, intersections, or driveways. Nor does the project propose to close any existing roadways, intersections, or driveways. During construction activities, slight delays to emergency access could occur due to construction vehicles accessing the project site. However, construction activities would be short-term and temporary. The project's effects on emergency access would be limited to construction of the project and would be temporary in nature. Therefore, impacts related to inadequate emergency access would be less than significant.

f) *Conflict with adopted polices, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?*

Less Than Significant Impact. The proposed project may increase pedestrian and bicycle activity in the vicinity of the project. Currently, roadways near the project site provide some pedestrian facilities; however, sidewalk gaps, obstacles, and barriers can be found along the roadways connecting to the project site. Class II bike lanes are proposed on SR 12. Implementation of the proposed project does not preclude the ability to provide these facilities in the future and existing facilities serving the project site are adequate to accommodate the alternative transportation needs of visitors to the Lawson

Expansion. Therefore, the project would not conflict with adopted policies or programs supporting alternative transportation. This impact would be less than significant.

XVII. TRIBAL CULTURAL RESOURCES

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in the Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	**Potentially Significant Impact**	**Potentially Significant Unless Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Listed or eligible for the listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k).			X	
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.			X	

Affected Environment

The discussion and analysis provided in this section is based on the cultural resources study conducted for the project site (Steen and Origer 2006). The consultation study area for tribal cultural resources is the Lawson Expansion, which is the area where ground-disturbing activities would occur.

Discussion

a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k).

Less Than Significant Impact. As part of the 2006 cultural resources study, Steen and Origer conducted a records search at the NWIC, which included a review of the National Register of Historic Places, the California Register of Historic Places, the California Inventory of Historic Resources, California Historical Landmarks, California Points of Historical Interest, the California Historical Resources Information System, and the Caltrans Historic Highway Bridge Inventory. The 2006 study identified four pre-historic and/or historical cultural resource sites in the Lawson Expansion: a Native American cultural resource of undetermined age and three historic-period cultural resources. In addition, 15 isolated artifacts were identified. Two sites, the Holst Homestead and the Streiff Homestead, are eligible for the CRHR.

In December 2016, Regional Parks provided formal notification to those California Native American tribes that are traditionally and culturally affiliated with the geographic area within which the proposed project is located pursuant to the consultation requirements of AB 52. Letters were sent to all tribal representatives identified by the Native American Heritage Commission.

Regional Parks has consulted with the Federated Indians of Graton Rancheria (FIGR) and the Mishewal-Wappo Tribe (Tribe) regarding management and protection of the Native American cultural resource on the site. Both FIGR and the Tribe agreed during this consultation on appropriate measures to protect and interpret the site's pre-historic cultural resources. These measures have been incorporated into the MP/RMP.

Therefore, the proposed project would not cause a substantial adverse change in a California Native American tribal cultural resource that is listed or eligible for listing in the California Register of Historical Resources or in a local register of historical resources, as defined in Public Resources Code section 5020.1(k).

b) *A resource determined by the lead agency in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.*

Less Than Significant Impact. As described above, Regional Parks has consulted with the Federated Indians of Graton Rancheria (FIGR) and the Mishewal-Wappo Tribe (Tribe) regarding management and protection of the Native American cultural resource on the site. Both FIGR and the Tribe agreed during this consultation on appropriate measures to protect and interpret the site's pre-historic cultural resources. These measures have been incorporated into the MP/RMP.

Implementation of these measures would satisfy the agreement between Regional Parks and tribal representatives under AB 52, and ensure potential impacts from the proposed project would be less than significant.

In the unlikely event that previously unidentified archaeological resources are discovered during construction of proposed improvements, implementation of **Mitigation Measure CULT-2** would be required. Compliance with existing regulations as specified in **Mitigation Measure CULT-2** would reduce the potential for impacts to unidentified archaeological resources to a less than significant level. Refer to Section V, Cultural Resources, for measures pertaining to unidentified archaeological, historical, or paleontological resources, or discovery of human remains.

XVIII. UTILITIES AND SERVICE SYSTEMS

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?			X	
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X	
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X	
d) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?			X	
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			X	
g) Comply with federal, State, and local statutes and regulations related to solid waste?				X

Affected Environment

A variety of local and regional purveyors provide and maintain utility and service system facilities associated with electricity, water, stormwater, wastewater, solid waste, communications and natural gas in Sonoma County. The site currently has no existing utilities. Spring water is available on site.

The proposed trails have been designed to conform to the existing grade to the extent possible and would result in minimal alterations to the existing drainage conditions.

Discussion

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Less Than Significant Impact. Implementation of the proposed project would expand an existing park and develop additional trails and campsites for recreational use. In addition, a permanent waterless, pump-out restroom facility would be installed on the site to service the four campsites and overnight cabin. Regular pump-out service for the portable restroom facility would be provided and wastewater would be hauled out and disposed of at the Laguna Treatment Plant in the City of Santa Rosa.[4] Wastewater generated by the portable restroom facility would not exceed the wastewater treatment requirements of the North Coast RWQCB. A less than significant impact related to this topic would occur.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Less Than Significant Impact. The proposed project would include the installation of a pump-out restroom facility. Wastewater from the restroom facility would be hauled away and disposed of at the Laguna Treatment Plant. The proposed project would not generate a substantial amount of wastewater. Therefore, implementation of the proposed project would not require or result in the construction of new wastewater treatment facilities or expansion of existing facilities. A less than significant impact related to wastewater would occur.

The existing water system on the project site consisted of pumping spring water uphill to a storage tank; however, the system no longer is functional. Spring water would continue to be utilized on site by campers, but would need to be treated as non-potable water. In addition, a solar water pump would be installed on-site. No wells or City water are provided on site. Therefore, implementation of the proposed project would not require or result in the construction of new water facilities or expansion of existing facilities. A less than significant impact related to water would occur.

[4] Most likely wastewater from the restroom facility would be disposed of at the Laguna Treatment Plant in the City of Santa Rosa; however, the exact location is dependent upon the wastewater hauler. Sonoma County Regional Parks currently uses United Site Services for portable and pump-out toilets. United Site Services is required to dispose of wastewater within the same county the wastewater was collected.

c) *Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?*

No Impact. No stormwater drainage facilities are currently located on site; therefore, no improvements would be required. In the existing condition, stormwater runoff follows the natural land pattern and infiltrates into the ground. Under the proposed condition, stormwater runoff would continue to follow the natural terrain and infiltrate into the ground, maintaining the existing drainage pattern to the maximum extent practicable. The trails would be outsloped and the camping sites would be sloped so stormwater runoff could drain across the site so runoff would not concentrate in pools. Stormwater runoff from the bunkhouse and restroom would travel through downspouts and be directed to a water collection device and then a drainage channel. Therefore, no impacts to stormwater drainage facilities would occur with implementation of the proposed project.

d) *Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?*

Less Than Significant Impact. See XVII(b), above.

e) *Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?*

Less Than Significant Impact. See XVII(a), above.

f) *Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?*

Less Than Significant Impact. Construction of the proposed project would generate a small amount of solid waste. The majority of the construction waste would be dirt and paving materials, as well as waste generated by construction workers. The generation of construction waste would be temporary, would cease when construction is complete, and would not be substantial. Construction debris would be recycled and/or disposed of at one of the four transfer stations within the County (Healdsburg, Annapolis, Guerneville, and Sonoma) or the Central Landfill. The closest transfer station to the project site is the Sonoma Transfer Station, which is located approximately 18 miles southwest of the project site. The Central Landfill is located approximately 15 miles southwest of the project site. These facilities have the capacity to handle the nominal amount of construction waste generated by the proposed project. Therefore, construction of the proposed project would result in a less than significant impact to solid waste and landfill facilities.

Users of the trails and park are expected to generate a minimal amount of solid waste, which would be deposited in trash receptacles located through the project site. In addition recycling receptacles would be located throughout the park, allowing the proposed MP/RMP to be in full compliance with waste diversion goals mandated by the

California Integrated Waste Management Act. Therefore, operation of the proposed project would result in a less than significant impact to solid waste and landfill facilities.

g) Comply with federal, State, and local statutes and regulations related to solid waste?

No Impact. Sonoma County Regional Parks currently complies with federal, State, and local statutes related to solid waste recycling. These programs would continue with implementation of the proposed project. Therefore, the proposed project would comply with all federal, State, and local statues and regulations related to solid waste.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?		X		
b) Does the project have impacts that are individually limited, but cumulatively considerable? (Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)			X	
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		X		

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?

Potentially Significant Unless Mitigation Incorporated. As described in this Initial Study, implementation of the proposed project would have the potential to adversely impact special-status plant and animal species, wetlands, and previously undiscovered cultural and paleontological resources and/or human remains. Implementation of the mitigation measures recommended in this Initial Study would ensure that construction and operation of the proposed project would not: 1) degrade the quality of the environment; 2) substantially reduce the habitat of a fish or wildlife species; 3) cause a fish or wildlife population to drop below self-sustaining levels; 4) threaten to eliminate a plant or animal community; 5) reduce the number or restrict the range of a rare or

endangered plant or animal; or 6) eliminate important examples of the major periods of California history or prehistory.

b) *Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)*

Less Than Significant Impact. The impacts of the proposed project would be individually limited and not cumulatively considerable. The proposed project would expand an existing park and develop new trails and campsites. As described in this Initial Study, impacts associated with the proposed project would be temporary, construction-related and would be reduced to a less than significant level with implementation of the mitigation measures contained herein. Therefore, the proposed project would not make a considerable contribution toward a cumulative impact related to construction. Additionally, the proposed project would not generate a significant amount of greenhouse gas emissions and would therefore not result in a cumulatively considerable impact to global climate change.

c) *Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?*

Potentially Significant Unless Mitigation Incorporated. As described in this Initial Study, any potential environmental impacts from the proposed project would be reduced to a less than significant level with the implementation of the recommended mitigation measures. With implementation of measures both incorporated into the project design and recommended as mitigations to reduce the impacts associated with air quality, biological resources, cultural resources, and geology and soils, the proposed project would not result in substantial adverse effects on human beings.

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APPENDIX A
MP/RMP POLICIES

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MP/RMP GOALS AND GUIDELINES

PROJECT GOALS

- Develop a Master Plan that provides a range of recreational opportunities, balances recreation with natural resource protection, protects unique natural and cultural resources; and encourages public education and interpretation.
- Provide accessible facilities and trails for a variety of users and user abilities.
- Develop facilities sensitive to the unique environment.
- Develop a Resource Management Plan.

RESOURCE MANAGEMENT GUIDELINES

The following sections outline more specific objectives that provide direction on how to meet these project goals based on specific topics – resource management, public access and recreation, interpretation and education. Objectives state the intended results for management actions that promote the resource, interpretation, and maintenance goals for the Lawson Expansion. While the achievement of goals and objectives will be based on the availability of agency resources such as personnel and funding, priority spending of available resources will be in alignment with the Vision and Mission Statements of Regional Parks.

Natural Resources

The management guidelines for the natural resources in the Lawson Expansion are based on analysis of existing reports; soil, vegetation, and wildlife surveys; and information gathered from databases to assist in the discussion of invasive plant species, sensitive species, and habitats. The major intent of the following objectives and policies is to provide a strategy by which the natural resources of the Lawson Expansion can be managed, conserved, and enhanced, while at the same time providing educational and recreational opportunities for the public.

Unless marked with an asterisk (“*”), the following management objectives and strategies are not mandates and are intended to identify gaps in knowledge and suggest ways to eliminate them, establish sound data management and monitoring techniques, and provide the framework that will assist park managers in making informed management decisions. The provisions below marked with an asterisk are mandatory measures to mitigated potential environmental impacts.

BIO-1 Maintain populations of native plants and wildlife with special emphasis on management of locally uncommon, sensitive, federal and/or State threatened or endangered species and special-status vegetation alliances.

BIO-1.1 Protect and maintain special-status vegetation alliances, including madrone forest, California oat grass prairie, blue wild rye meadows, Idaho fescue grassland, purple needle grass grassland and Sargent cypress woodland.

*BIO-1.1a Provide a 25-foot vegetated buffer for proposed recreational improvements identified in this MP/RMP.

*BIO-1.1b The hiker-only section of Wild Lilac Trail is designed to protect the blue wild rye native grass in proximity to the trail alignment. This trail segment will be aligned to avoid the native grass, but may be within the 25-foot buffer on final alignment.

BIO-1.2 Protect and maintain populations of sensitive, threatened, or endangered plant species, notably Sonoma ceanothus and Napa false indigo.

*BIO-1.2a Provide a vegetated buffer of 100 feet or use existing road/trail alignment through these areas for proposed recreation improvements identified in this MP/RMP.

BIO-1.3 Protect and maintain potential nesting and foraging habitat for sensitive, threatened, or endangered raptor species, notably northern spotted owl.

BIO-1.4 Protect and maintain all native wildlife communities and movement.

BIO-1.5 Protect and maintain all native vegetation communities paying special attention to mixed evergreen forest, oak woodland, chaparral, and native grasslands.

*BIO-1.6 If vegetation clearing and/or trail maintenance is planned for the bird nesting season (February 15 through August 31), conduct a nesting bird survey prior to construction to determine if there are any active nests in or adjacent to the work area. If an active nest is found in or adjacent to the work area a suitable buffer, as determined by a qualified biologist, should be established around the nest until the young have fledged or the nest has otherwise become inactive.

BIO-2 Avoid impacts to jurisdictional waters

BIO-2.1 Design trails and other improvements to avoid impacts to jurisdictional waters, to the greatest extent practicable. Prior to final design, conduct a jurisdictional delineation at all in-stream crossings, or clear span streams with trail bridges to avoid jurisdictional areas.

BIO-3 Implement monitoring programs designed to identify ecosystem threats (e.g., invasive species, recreation use, and erosion) and use monitoring data to guide management of the area.

BIO-3.1 Manage and work to eliminate, as feasible, existing exotic invasive infestations, particularly french broom, yellow starthistle, and silverleaf cotoneaster identified in the Lawson Expansion. See Appendix E for more detail.

BIO-3.1a Control of French broom can be achieved by repeated mechanical (e.g., hand pulling seedlings and small plants, using a weed wrench or other woody weed extractor for larger shrubs) and chemical methods (e.g., application of herbicide as cut stump treatments or as foliage spot treatment).

BIO-3.1b A combination of grazing, mowing, burning, and herbicide use is most effective for controlling yellow star thistle.

BIO-3.1c Control of cotoneaster can be achieved by repeated mechanical (e.g., hand pulling seedlings and small plants) and chemical methods (e.g., application of herbicides), ideally a combination of both.

BIO-3.2 Monitor invasive non-native plant species on the Property and incorporate management strategies to minimize and/or eliminate. Particularly invasive species identified in the Lawson Expansion (French broom, yellow-star thistle, and silverleaf cotoneaster) should have a monitoring and treatment priority. Monitor the spread of known populations of non-native plant species, conduct routine surveys for early detection of new invasive plants on the Property, and develop appropriate adaptive management responses. Use volunteer work crews, as appropriate, to remove exotic species.

BIO-3.3 Monitor native habitat types within the Lawson Expansion to assess their condition and document changes. Incorporate adaptive management strategies as necessary to maintain habitat quality. Trained trail-walk volunteers can be used to monitor site conditions, as a supplement to natural resource and operations maintenance crews as eyes and ears on the ground. Incorporate adaptive management strategies, as necessary, to maintain these populations/communities. Possible adaptive management strategies include removal of exotic species (BIO-3.1 and BIO-3.2), repair/maintenance of recreational facilities (REC-1.5, MAINT-1.3, MAINT-1.4 and MAINT-3.2), enforcement of park rules to ensure appropriate use (MAINT-3.1, MAINT-3.2, and MAINT-3.3), and installation of interpretive signage providing users information on best use practices (INTERP-1.2, INTERP-2.1 and INTERP-2.2).

BIO-3.4 Document the location and extent of locally uncommon, sensitive, threatened or endangered species and other sensitive or special status resources within the project area. Monitor these resources annually in order to determine the effects of recreation use and other management activities. A comprehensive inventory of natural and cultural resources located within the Lawson Expansion will be updated and maintained by Parks' staff in order to effectively manage and protect these resources.

BIO-3.5 Continue to implement adaptive management strategies to protect aquatic habitat and water quality by reducing nutrient loading and sedimentation potentially impacting beneficial uses in the watershed (see MAINT-1.4).

BIO-3.6 Enforce park rules (i.e. dogs on leash no longer than 6 feet, stay on trails, hiker-only trails).

Cultural Resources

The Property lies within the Federated Indians of Graton Rancheria (FIGR) ancestral territory. FIGR, a federally recognized tribe, is made up of families from both the Coast Miwok and Southern Pomo territories. Regional Parks is in active and ongoing consultation with FIGR in compliance and with AB52. Regional Parks is and will continue collaborating with FIGR to protect and preserve pre-historic resources. If another Tribe considers the Property to be part of their ancestral territory, Regional Parks will make all reasonable effort to consult with that self-identified[5] tribe.

The overall goal of the MP/RMP is to present a comprehensive, long-term management plan for the Lawson Expansion. In dealing with any potential cultural resources located within the project site, the principal fundamental objective is the identification of the best way to manage, protect, and enhance cultural resources while still providing educational opportunities to the public as well as a safe recreational environment. Recommended objectives and strategies for cultural resources within the Lawson Expansion are described below.

CULT-1 Protect and preserve cultural resources in the project site.

*CULT-1.1 Establish a protective barrier at CA-SON-67 to prevent unauthorized public access and vandalism. Consultation between Regional Parks, and the Tribes that consider the Lawson Expansion within their tribal territory, will reach agreement on the need for the type of permanent barrier at CA-SON-67 to prevent unauthorized access. This barrier will be erected in consultation with an engineer or geologist, and an archaeologist to prevent inadvertent damage to the site during installation.

*CULT-1.2 Any trail(s) established in the vicinity of CA-SON-67 will have a minimum setback of at least 200 feet from the resource. To reduce the potential for volunteer trail spurs to CA-SON-67, this cultural resource will not be visible from any proposed trail(s).

[5] Self-identified tribes are those tribes in addition to FIGR that recognize the Lawson Expansion as part of their ancestral lands.

*CULT-1.3 Comply with the management recommendations for the Holst and Streiff homestead site developed by Tom Origer & Associates in the "Response to Sonoma County Regional Park Follow-up Questions", dated March 16, 2009.

*CULT-1.4 Consult with a qualified archaeologist to oversee implementation for siting proposed improvements and site-specific measures to avoid possible archaeologically significant deposits.

*CULT-1.5 Avoid the historic trash scatter. No new facilities or improvements are currently planned at the historic trash scatter.

*CULT-1.6 Conduct cultural sensitivity training with tribal cultural monitor and/or tribal representative for construction personnel working on the Property. Prior to construction of improvements identified in this MP/RMP, construction personnel will be required to complete a sensitivity training program so that they are cognizant of what constitutes a potentially important archaeological deposit. Work should cease in the event that a potentially important archaeological deposit is identified, and a qualified archaeologist should be contacted to evaluate the deposit and make recommendations for the deposit's treatment. A qualified archaeologist will provide this training.

*CULT-1.7 Stop work if archaeological deposits are identified. Work will cease in the event that a potentially important archaeological deposit is identified, and a qualified archaeologist will be contacted to evaluate the deposit and make recommendations for the deposit's treatment.

CULT-1.8 Remove all volunteer trails leading to, or across, archaeological sites. Park staff will regularly monitor for the presence of "volunteer trails" (i.e., unauthorized trails created from bike, horse, or pedestrian travel outside of designated trails). Volunteer trails will be closed and their use discouraged through a variety of methods, including signage, obstructive barriers, public education, volunteer patrols, and/or citations.

CULT-2 Educate park users as to the significance of resources in the project site.

CULT-2.1 Establish interpretive panels at appropriate locations. Interpretive panels will be installed that describe the cultural and historical significance of resources. Panels will be strategically placed to best protect these sites from vandalism and the unauthorized collection of artifacts. Preparation of any interpretive materials for CA-SON-67 will be done in consultation with FIGR or other self-identified Tribe/s.

CULT-3 Work cooperatively and collaboratively with Native American Tribes that consider the Lawson Expansion part of their tribal territory.

CULT-3.1 In compliance with AB52, Regional Parks will consult with Native American tribes that are traditionally or culturally affiliated with the Lawson Expansion geographic area as part of the environmental review process.

CULT-3.2: Continue to work with the Federated Indians of Graton Rancheria (FIGR) and other self-identified tribal groups as improvements are designed and constructed to ensure tribal cultural resource are protected and preserved.

CULT-3.3: Enter into agreements with FIGR or other Tribe/s for cultural preservation and protection activities.

Visual Resources

The Lawson Expansion represents a significant visual and scenic resource within the region, offering panoramic views of the surrounding mountains, the Bay and the Sonoma Valley in the distance. From an aesthetic standpoint, the Lawson Expansion benefits the surrounding urban environment by providing outdoor recreation, enhancing property values, improving the quality of life, stimulating the senses, offering a wealth of outdoor experiences, and giving unique perspectives to view the surrounding region. The viewshed from within the project site contributes to the overall quality of visitors' experience and enjoyment. Together with the larger Hood Mountain, the Lawson Expansion provides a wealth of viewing conditions and opportunities, offers visitors the experience of escaping the stresses of urban living and provides a respite for them to rejuvenate their minds and bodies. The visual landscape contributes to this process.

VISUAL-1 Protect and enhance views and distinctive landscape features that contribute to the setting, character and visitor experience of the area, including the Highway 12 scenic corridor.

VISUAL-1.1 Give high priority to maintaining the visual quality of the undeveloped landscapes surrounding the area of proposed projects. Design proposed improvements to blend into the surroundings and complement the existing visual setting of the project site. Facilities should be generally low-profile to protect scenic views and constructed of natural materials.

VISUAL-1.2 Expand interpretive opportunities associated with the visual and scenic resources of the area. Provide visitor access to key scenic viewpoints. Install interpretive signage and/or facilities (e.g., benches, picnic facilities) at these key vistas.

VISUAL-1.3 Use native plantings to visually buffer developed areas, enhance visual quality and integrate with the surrounding native landscape. Vegetation removal to accommodate proposed improvements should be minimized and replacement landscaping installed, as needed, to screen improvements.

VISUAL-1.4 Locate site structures to be sensitive to scenic views from and into the project area.

VISUAL-1.5 Develop site facilities with the goal of protecting the project area from ambient light sources and preserving existing night sky views.

*VISUAL-1.5a If lighting is determined to be necessary it will conform to the international dark-sky association standards.

PUBLIC ACCESS AND RECREATION

Since the primary goal is to preserve and protect resources, Regional Parks will provide public access to the project area while looking for opportunities to minimize impacts on the site's natural and cultural resources. Consistent with its purpose, Regional Parks will focus on improving the current network of roads and trails and will identify new trail routes that provide key connections to adjacent open space areas and existing facilities, access to key scenic vistas, and a variety of experiences for visitors.

REC-1 Provide a trail system that balances resource protection with high quality public access, maximizing, to the extent feasible, sensitive resource protection. Design trails in accordance with appropriate trail standards, including the California Department of Parks and Recreation's Trails Handbook (1991) and Accessibility Guidelines (2015) and the California Department of Conservation and Recreation's Trail Guidelines and Best Practices Manual (2010). See below for Trail Standards REC-1.1 through REC-4.3.

*REC-1.1 Utilize existing roads/trails, as feasible, to minimize ground disturbance.

*REC-1.2 Locate new trails away from sensitive habitat areas, as possible. In sensitive habitat areas, trail use level should be limited to ensure protection of resources. Techniques for limiting use may include, but are not limited to physical access controls, seasonal or intermittent closures, and restricted use permits.

REC-1.3 Minimize riparian crossings to decrease disturbance of sensitive natural areas.

REC-1.4 Provide diverse and interesting trail experiences that accommodate a variety of users and user abilities through interesting terrain and various habitats.

*REC-1.5 Use best management practices (BMPs) in the design, construction, and maintenance of trails, including temporarily closing trails when needed. Minimize heavy traffic loads during the rainy season. Equestrians and mountain bikers can have a greater impact on the trail tread and may cause accelerated damage or erosion. Use of certain trails may be restricted in order to prevent manure from collecting above water features, picnic areas and campsites or to prevent erosion during wet weather conditions.

REC-1.6 Implement trails in partnership with other public agencies, non-governmental organizations and private landowners, when this coordination makes sense.

REC-1.7 Implement a trail system that is considerate of adjacent landowner interests, and is consistent with protecting natural, visual, and cultural resources.

REC-1.8 Close key gaps in the trail system and create an interconnected system of public open spaces (e.g., Hood Mountain, Sugarloaf Ridge State Park) and from nearby communities.

REC-1.9 Seek methods to establish partnerships among trail interest groups to improve cooperation for trail use, volunteer maintenance opportunities, and preservation of habitat.

REC-1.10 Maintain trails in an environmentally sustainable manner by using natural materials when possible, restoring damaged areas, reducing or avoiding the use of chemicals, minimizing disturbance of habitat, and limiting runoff and needed maintenance grading.

REC-2 Create a trail system that provides a broad public benefit by accommodating diverse uses and user abilities.

REC-2.1 Where reasonably feasible and to the greatest extent possible, provide access for people with disabilities within the context of Regional Parks' purpose, policies, and legal requirements. Develop trails in varying lengths and levels of physical exertion to accommodate a variety of different users' interest.

REC-2.2 Connect Lawson Expansion trails to regional trails where appropriate.

REC-2.3 Allow trail use on the property by hikers, mountain cyclists, equestrians, back-packers, dog-walkers (dogs on maximum 6-foot lead), birdwatchers, picnickers, and other similar recreational uses.

REC-3 Enforce protection of the varied resources and promote an enjoyable and safe environment for visitors.

REC-3.1 Acknowledging the natural and scenic beauty of the project area will be accomplished with interpretive panels, ranger led-hikes and events, and/or subject expert volunteers. Facilitating the enjoyment of the outdoors and promoting the safety of visitors will include ranger patrols, clear park regulatory signage at trailheads, and with volunteer trail patrols.

REC-3.2 Allow trail use on the property, consistent with the goal of preserving and protecting site resources. Prior to implementation of specific trail routes or development of proposed facilities, surveys for sensitive and special-status plant species should be conducted in the appropriate seasons. These assessments should include recommendations to align the trail to avoid impacts to sensitive habitats, special-status species, and significant trees.

REC-3.3 Discourage the use of trails that are not part of the system of maintained trails. Shortcuts and unauthorized trails should be eliminated as soon as they are discovered. Closure may be accomplished by covering the trails with leaf litter and blocking them with physical barriers, or by posting signage and delivering citations as necessary to discontinue any additional human disturbance.

REC-3.4 Prohibit the use of motorized vehicles, with the exception of authorized staff vehicles.

REC-4: Accommodate parking, access points, trail amenities, and other recreational facilities that maintain the natural character of the land, enhance resource protection and contribute to the enjoyment of open space.

REC-4.1 Provide access points from existing park infrastructure. Collaborate with Team Sugarloaf (a partnership of five non-profit organizations dedicated to the natural resources of Sonoma Valley and in particular Sugarloaf Ridge State Park) and others to provide transportation from linked trail, trailheads.

REC-4.2 Provide trail amenities such as, but not limited to: information displays, restroom facilities, facilities to provide water and tie horses, trash cans, and potable water. Signs will inform visitors which uses are appropriate, permitted, or prohibited on the trail; identify accessibility conditions and other ADA-related information; educate trail users about natural resources and respecting private property along the trail route, and any special land use considerations.

INTERPRETATION/EDUCATION

Through a variety of interpretive tools such as signs, display cases, printed material, and public programs, Regional Parks will strive to educate the public on the importance of preserving the surrounding habitat not only for the wildlife, but for future generations to explore and enjoy. Regional Parks will focus on creating interpretive programs that educate both individuals and communities on the importance of preserving, understanding, and coexisting with the area's natural resources and understanding the history of the site. A wide variety of educational/interpretive programs for a broad audience will include: programs in English and Spanish, for a diversity of ages and family status such as children, families, and seniors. Programs will focus on the natural environment like birdwatching, wildflower walks or beginner back pack experience.

INTERP-1 Provide relevant interpretive and education programs that increase the public's understanding and appreciation of the significant natural and cultural resources of the project area.

INTERP-1.1 Develop a comprehensive interpretive plan for the site integrated with the broader Regional Park interpretive plan. The interpretive plan should articulate strategies to implement the goals and objectives for interpretation including new facilities, interpretive trails, interpretive displays and engaging public programming (self-guided tours, brochures, maps, and school programs).

INTERP-1.2 Establish facilities to enhance the public's understanding of the site's resources.

INTERP-1.3 Provide opportunities for community involvement and education. Bid and maintain partnerships with environmental and educational organizations for public outreach and education.

INTERP-1.4 Ensure program participation is accessible for diverse user groups, including under-served audiences.

INTERP-2 Provide a trail system that promotes and enhances public enjoyment and appreciation of the natural, cultural and scenic resources.

INTERP-2.1 Utilize interpretive signs on barriers educating users on why public access is prohibited.

INTERP-2.2 Incorporate the Property improvements into the existing Hood Mountain trail map that is accessible from the Regional Parks' website.

INTERP-2.3 Provide trail display cases that include a summary of the rules within the Hood Mountain Park and Preserve.

INTERP-2.4 Provide information to trail users to facilitate orientation, natural and cultural resource interpretation, compliance with park rules, and appropriate trail etiquette. Interpretive and protective signs should be located where appropriate. Interpretive and protective signs should indicate natural resource or historical points of interest or sensitive areas. Signs should be designed to identify specimen habitat types and to educate the visitor by describing resource characteristics and values.

INTERP-2.5 Educate trail users on the potential impacts that trail uses have on wildlife, cultural resources, and the environment.

INTERP-2.6 Promote volunteer participation in leading interpretive hikes, trail stewardship, and monitoring.

INTERP-3 Maintain strong community relations to ensure a positive visitor experience with minimal adverse impacts on neighbors.

INTERP-3.1 Maintain ongoing communication between Regional Parks, community organizations, and neighbors to maximize potential benefits and opportunities. Provide relevant information for local residents through the Regional Parks' website.

INTERP-3.2 Survey visitors periodically to identify trends in educational and recreational uses and attitudes. Adjust services, as feasible for education outreach, and/or operations to accommodate trends.

INTERP-3.3 Work with local environmental education, social services, recreation groups and the public to establish programs and events that promote stewardship and increase awareness of the project site's natural and cultural resources.

FACILITY MAINTENANCE

The main priority for Regional Parks is the stewardship of site resources for both present and future generations. Ongoing maintenance promotes successful implementation of resource management activities. Routine operations and maintenance efforts on the project site also keeps the site safe, functional, and attractive for residents and visitors. Regional Parks will maintain facilities in the Lawson Expansion to ensure that resource values are preserved and that management activities are supported. Regional Parks will maintain trails and roads to prevent erosion and provide a safe and high-quality visitor experience.

MAINT-1 Maintain facilities to ensure that resource values are maintained and that management activities are supported.

MAINT-1.1 Maintain facilities and infrastructure, such as gates, fences, and roads. Identify areas where fencing is needed or should be removed. Establish property signs along the site boundary identifying the area as a regional park and providing directions for access and contact information.

MAINT-1.2 Maintain trailhead facilities and other structures that contribute to the integrity and value of the project area.

MAINT-1.3 Maintain trails by clearing brush, maintaining cross slope and unobstructed drainage features, performing other maintenance and implementing BMPs to promote an environmentally sound and user-safe trail system.

MAINT-1.4 Identify and evaluate areas that are subject to erosion. A qualified professional should determine the specific practices needed and direct installation as appropriate. All BMPs must be chosen carefully, located and installed correctly, and maintained well to be effective in controlling erosion and sediment. Ensure that sediment-trapping devices and erosion control measures are accessible for maintenance and removal.

MAINT-1.5 Establish and maintain shaded fuel breaks and implement and maintain fuel load reduction plan.

MAINT-1.6 Utilize low-impact seasonal grazing to reduce fuels and promote biodiversity.

MAINT-2 Remove litter, trash and debris that may attract or injure wildlife and reduce the aesthetic values of the project area.

MAINT-2.1 Remove the existing debris piles located at the northern boundary to preserve and improve nearby drainage channels and other natural resources on the site.

MAINT-2.2 Install bear resistant trash containers and bear boxes at campsites.

MAINT-2.3 Establish responsibilities for removing trash and for regular collection at specific locations.

MAINT-2.4 Enlist the help of volunteers for clean-up events at the site.

MAINT-3 Patrol public use of the Lawson Expansion to ensure compliance with rules and regulations and to assess level of use.

MAINT-3.1 As budget allows, provide sufficient ranger staff to adequately address misuse of trails or other facilities.

MAINT-3.2 Inspect the trails to monitor and mitigate for impacts. Mitigation may include restoring trail outslope, installing rolling dips, and pruning along the edge of the trail.

MAINT-3.3 Issue citations, as needed, to persons that violate park regulations.

APPENDIX B
TRAFFIC STUDY

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June 21, 2017

Ms. Karen Davis-Brown
Sonoma County Regional Parks
2300 County Center Drive #120A
Santa Rosa, CA 95403

Focused Traffic Study for Hood Mountain Lawson Expansion

Dear Ms. Davis-Brown;

W-Trans has completed a focused traffic analysis for the *Hood Mountain Regional Park and Open Space Preserve Lawson Expansion Master Plan* in the County of Sonoma. The purpose of this analysis was to study the potential traffic impacts of the expansion on the study area that provides access to the project site, as well as assess facilities for alternative modes.

Hood Mountain Regional Park is an existing 2,195.41-acre Regional Park that includes trails and hike-in camping in unincorporated Sonoma County near eastern Santa Rosa with access via Pythian Road and Los Alamos Road, which both connect to State Route (SR) 12. The proposed Lawson expansion would add 247.26 acres.

Existing Conditions

The study area consists of the following locations:

1. SR 12/Los Alamos Road intersection
2. SR 12/Pythian Road intersection
3. Los Alamos Road secondary access and parking lot
4. Pythian Road primary access and parking lot

Conditions during the weekday a.m. and p.m. and weekend midday peak periods were evaluated.

SR 12/Los Alamos Road is a four-legged signalized intersection with protected left-turn phasing on the eastbound and westbound SR 12 approaches and permitted left-turn phasing on the northbound and southbound approaches. Marked crosswalks are provided on the north, south, and west legs.

SR 12/Pythian Road is also a signalized intersection with four legs. The eastbound and westbound approaches have protected left-turn phasing while the northbound and southbound approaches have permitted left-turn phasing. There are crosswalks on the north and east legs.

Los Alamos Road, north of SR 12, has a posted speed limit of 35 mph. Approximately 3.7 miles north of SR 12, the road becomes a one-lane road with advisory speeds posted at 10 mph in advance of curves.

Pythian Road is a two-lane road at its intersection with SR 12. The road narrows to one lane with advisory speed signs of 15 mph approximately 0.9 miles north of SR 12, with one lane in each direction and no shoulders.

Traffic counts for SR 12/Los Alamos Road were obtained August 2, 2016 for the weekday peak periods and April 1, 2017 for the weekend midday peak hour. At SR 12/Pythian Road, data was collected on September 23, 2014 for the weekday a.m. peak hour, March 30, 2017 for the weekday p.m. peak hour, and April 1, 2017 for the weekend midday peak hour. Since weekday a.m. peak hour traffic counts at SR 12/Pythian Road are older than two years, a growth factor was derived from historical SR 12 segment volumes and applied to the volumes to arrive at 2017 volumes. Signal timing acquired from Caltrans was applied to the analysis. Under these existing volumes and controls, the intersections are operating at LOS B overall. These results are shown in Table 1.

Table 1 – Existing Peak Hour Intersection Levels of Service

Study Intersection	AM Peak Hour		PM Peak Hour		Weekend MD Peak Hour	
	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 12/Los Alamos Rd	11.7	B	13.4	B	12.1	B
2. SR 12/Pythian Rd	15.2	B	13.5	B	14.0	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service

Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is January 1, 2012 through December 31, 2016.

As presented in Table 2, the calculated collision rates for the study intersections were compared to average collision rates for similar facilities statewide, as indicated in *2013 Collision Data on California State Highways*, California Department of Transportation. The intersection of SR 12/Los Alamos Road experienced a collision rate close to the statewide average for similar facilities. Five out of the 12 collisions had a primary collision factor of "Unsafe Speed." The collision rate calculations are enclosed.

Table 2 – Collision Rates at the Study Intersections

Study Intersection	Number of Collisions (2012-2016)	Calculated Collision Rate (c/mve)	Statewide Average Collision Rate (c/mve)
1. SR 12/Los Alamos Rd	12	**0.29**	0.27
2. SR 12/Pythian Rd	8	0.25	0.27

Note: c/mve = collisions per million vehicles entering

Future Conditions

Segment volumes for the horizon year of 2040 were obtained from the County's gravity demand model and translated to turning movement volumes at the study intersections using the "Furness" method for the weekday a.m. and p.m. peak hours. The Furness method is an iterative process that employs existing turn movement data, existing link volumes and future link volumes to project likely turning future movement volumes at intersections. The Future 2040 volumes account for regional growth in the area as well as infill development (i.e. various approved projects such as the Sonoma Valley Regional Park expansion) between 2017 and 2040. For future weekend midday volumes, a growth factor was calculated for each approach at the study intersections during both the a.m. and p.m. peak hours and then averaged. The average growth factor for weekday peak hours for each approach was applied to the weekend midday existing volumes to arrive at weekend midday 2040 volumes. Under these projected Future volumes the intersections are expected to operate at LOS B overall. These results are shown in Table 3.

Table 3 Future Peak Hour Intersection Levels of Service

Study Intersection	AM Peak Hour		PM Peak Hour		Weekend MD Peak Hour	
	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 12/Los Alamos Rd	12.5	B	14.3	B	13.1	B
2. SR 12/Pythian Rd	18.6	B	16.4	B	15.6	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service

Project Description

The proposed Lawson expansion of the Hood Mountain Regional Park would add 247.26 acres to an existing 2,195.41 acres of space that includes trails and hike-in camping in unincorporated Sonoma County between Santa Rosa and Sonoma. Access would continue to be provided via Pythian Road and Los Alamos Road, which both connect to SR 12. The project would use existing parking/trailhead areas.

Trip Generation

The anticipated trip generation for the proposed project is generally estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 9th Edition, 2012. This publication includes information for a County Park (ITE LU #412) and a State Park (ITE LU #413) which would be the closest land use categories to the proposed Lawson expansion at Hood Mountain Park; however, these rates would generally overestimate the expected volume of traffic since they are based on surveys of parks with more active facilities such as sporting events with soccer fields, baseball fields, and a lake with launch ramps for boating.

Due to limitations of this data, surveys were previously collected at a trailhead parking lot for Shell Beach off of SR 1, south of SR 116. This lot serves as access to trailheads on both sides of SR 1 covering an estimated 800 acres. The data collected indicated that the Shell Beach parking lot generates traffic at a rate of 0.02 trips/acre of trail during a weekday p.m. peak hour and at 0.04 trips/acre of trail during a Saturday midday peak hour. This data has been used to determine vehicle trip generation rates for similar park trail facilities throughout Sonoma County.

In determining the appropriate trip generation rates for the project, the following information was considered:

Weekday AM Peak Hour

- The rate for a County Park (ITE Land Use #412) is 0.02 trips per acre.
- There are no weekday a.m. peak hour rates by acre for State Parks (ITE Land Use #413).

It is recommended the County Park rate of 0.02 trips per acre be used for the project due to the lack of rates for the Shell Beach parking lot and State Park.

Weekday PM Peak Hour

- The Shell Beach trailhead parking lot generates traffic at a rate of 0.02 trips per acre.
- The rate for a County Park (ITE Land Use #412) is 0.09 trips per acre.
- There are no weekday p.m. peak hour rates by acre for State Parks (ITE Land Use #413).
- The project more closely matches the State Park land use, as it specifically includes hiking trails along with campsites, picnic facilities, and general open space.

It is recommended the Shell Beach rate of 0.02 trips per acre be used for the project due to the lack of rates for a State Park. It was assumed the p.m. peak hour would make up 20 percent of the daily trips during a weekday, so the suggested daily rate is 0.10 trips per acre.

Weekend Midday Peak Hour

- The Shell Beach trailhead parking lot generates traffic at a rate of 0.04 trips per acre.
- The weekend trip rate for Shell Beach is twice the weekday p.m. peak hour rate.
- The rate for a County Park (ITE Land Use #412) is 2.21 trips per acre.
- The rate for a State Park (ITE Land Use #413) is 0.02 trips per acre.
- The project more closely matches the State Park land use since County Parks by the ITE Trip Generation definition generally include more active facilities, with ballfields, tennis courts, swimming, and boating facilities.

Since the ITE Trip Generation County Park rate is unreasonably high for the types of activities expected at the project site, it is recommended the weekday midday peak hour be based on the Shell Beach data at 0.04 trips per acre. The midday peak hour is expected to be 15 percent of daily trips, so the daily rate used is 0.27 trips per acre.

The trip generation summary for both the existing park acreage and the proposed expansion are shown below in Table 4. The expansion is expected to generate 25 weekday daily trips including 5 trips during the p.m. peak hour and 67 weekend vehicle trips including 10 peak hour trips.

Table 4 – Trip Generation Summary

Acres	Weekday Daily		AM Peak Hour 8:00 AM – 9:00 AM				PM Peak Hour 4:00 PM – 5:00 PM				Weekend Daily		Weekend Peak Hour 12:00 PM – 1:00 PM			
	Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out	Rate	Trips	Rate	Trips	In	Out
2,195.41	*0.10*	*220*	*0.02*	*44*	*22*	*22*	*0.02*	*44*	*22*	*22*	*0.27*	*593*	*0.04*	*88*	*44*	*44*
247.26	0.10	25	0.02	5	3	2	0.02	5	3	2	0.27	67	0.04	10	5	5

Note: *italics* represent existing rates and volumes; regular font represents proposed rates and volumes

Trip Distribution

The pattern suggested to allocate new project trips to the street network was determined based on familiarity with the area and surrounding region. The applied distribution assumptions and resulting trips are shown in Table 5 and illustrated in Enclosure 3.

Table 5 – Trip Distribution Assumptions

Route	Percent	Weekday AM Trips	Weekday PM Trips	Weekend MD Trips
SR 12 West	40%	2	2	4
SR 12 East	40%	2	2	4
Oakmont via Pythian Road south of SR 12	20%	1	1	2
TOTAL	**100%**	**5**	**5**	**10**

Existing plus Project Conditions

Upon the addition of project-related traffic to the Existing volumes, the study intersections are expected to operate acceptably at the same levels of service as without the project. These results are summarized in Table 6.

Table 6 –Existing plus Project Peak Hour Intersection Levels of Service

Study Intersection	AM Peak Hour		PM Peak Hour		Weekend MD Peak Hour	
	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 12/Los Alamos Rd	11.7	B	13.5	B	12.2	B
2. SR 12/Pythian Rd	15.3	B	13.4	B	14.1	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service

Future plus Project Conditions

The study intersections are expected to operate acceptably at the same levels of service as without the project when project-related trips are added to the Future volumes. These results are summarized in Table 7.

Table 7 –Future plus Project Peak Hour Intersection Levels of Service

Study Intersection	AM Peak Hour		PM Peak Hour		Weekend MD Peak Hour	
	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 12/Los Alamos Rd	12.6	B	14.3	B	13.2	B
2. SR 12/Pythian Rd	18.7	B	16.3	B	15.7	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service

Alternative Modes

Pedestrian Facilities

Pedestrian facilities generally include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. In the study area, there are marked crosswalks at the SR 12/Los Alamos Road and SR 12/Pythian Road intersections; however, sidewalk gaps, obstacles, and barriers can be found along the roadways connecting to the project site.

- **SR 12** – No sidewalks are provided on SR 12. Between Santa Rosa and Sonoma, SR 12 is a rural highway with scenic views, and sidewalks are generally not provided along the rural segments of SR 12. Further, they would be inconsistent with the character of the roadway.

- **Los Alamos Road** – No sidewalks are provided on Los Alamos Road. In general, Los Alamos Road is a narrow rural road with some residential development near SR 12, but otherwise it winds through hilly terrain, past farmland, and ends at the Hood Mountain Regional Park trailhead. Sidewalks and streetlights are generally not provided along rural roads such as this, nor would they be appropriate.

- **Pythian Road** – There is an all-weather path that is generally parallel to Pythian Road. The trail begins at SR 12 and goes approximately one mile to the main passenger vehicle-only parking area on Pythian Road for trail-users.

Finding – Pedestrian facilities serving the project site are adequate given the rural nature of the site.

Bicycle Facilities

Class II bike lanes are proposed on SR 12 between Farmers Lane and Kunde Winery Road. Developments that front SR 12 will have to dedicate right-of-way as necessary so that it will be available when the bike lanes are built. Currently, some more experienced cyclists ride on the shoulder of SR 12. These proposed facilities will provide adequate access for bicyclists. An illustration of alternative modes is provided in Enclosure 4.

Bicycle Storage

Short-term bicycle parking is provided at the site by bike racks which are located at the Pythian Road parking lot. There is no bicycle parking at the Los Alamos Road parking lot.

Finding – Bicycle facilities serving the project site are adequate at the Pythian Road parking lot, but not at the Los Alamos Road parking lot.

Recommendation – The Parks Department should consider installing a bike rack at the Los Alamos Road parking lot.

Transit

Sonoma County Transit provides service in the vicinity via bus stops on SR 12 at Los Alamos Road and Pythian Road.

Route 30 provides service between Santa Rosa and Sonoma. On weekdays, the route operates between 5:20 a.m. and 9:20 p.m. with 30-minute to two-hour headways. Weekend service is provided with four runs daily in the eastbound direction and three runs daily in the westbound direction. Route 34 provides weekday service between Santa Rosa and Sonoma, with one run eastbound for the morning commute and one run westbound for the evening commute.

Service between the Sonoma Valley and San Rafael is provided via Route 38. On weekdays, southbound service is provided once in the morning to San Rafael and northbound service is provided once in the evening to Sonoma.

For the handful of park users who choose to use transit to reach the project site, the bus stops on SR 12 at Pythian Road are within 700 feet to the path that is parallel to Pythian Road and leads to the other trails in Hood Mountain Regional Park.

Finding – Transit facilities serving the project site are adequate.

Parking Requirements

The County of Sonoma municipal code does not provide parking requirements for parks. The project was analyzed to determine whether the provided parking supply would be sufficient for the anticipated parking demand. There are a total of 50 parking spaces in the Los Alamos parking lot, 25 spaces at the Pythian lot, 80 overflow spaces in the Pythian overflow area, and the Pythian equestrian area can accommodate at least six trucks plus horse trailers for a total of 161 parking spaces.

It is noted that during the weekday p.m. peak period site visit on May 24, 2017, the parking supply was ample, as there were fewer than ten vehicles parked in the Los Alamos Road and Pythian Road parking lots.

The anticipated parking generation for a proposed project is generally estimated using standard rates published by ITE in *Parking Generation*, 4th Edition, 2010. This publication includes information for a "City Park" (ITE LU #411) which would be the closest land use category to a county park. However, city park uses generally represent active park facilities such as swimming pools, ponds or lakes, ball fields/courts, developed picnic sites, etc., most of which are beyond those anticipated for this project.

It should be noted that Sonoma County does not have a standard parking requirement for a "recreational facility" and states that parking requirements for all uses not specifically listed shall be determined by the Board of Zoning Adjustments or the Planning Commission. Data from the Sonoma County Parks Department indicates 41,000 visitors at Hood Mountain Regional Park per year. If the visitors were distributed evenly over the year, there would be 112 visitors daily. Assuming one visitor per vehicle, there would be 112 vehicles requiring parking over the

course of a day. The expansion is 11 percent of the existing park size. Assuming an 11 percent increase in parking demand, there would be a demand for 124 spaces per day. The 161 existing and proposed parking spaces appear to be adequate for the proposed demand.

Finding – Based on annual visitation, the parking supply is expected to be adequate for existing and proposed demand.

Conclusions and Recommendations

- The study intersections are currently operating at LOS B and will continue to operate at LOS B under Future conditions, including with project-generated trips added.
- The park expansion project is expected to generate 25 additional daily trips, including five additional trips each during the weekday a.m. and p.m. peak hours. On weekends, the park expansion is expected to generate 67 additional daily trips, including ten trips during the weekend midday peak hour.
- Pedestrian and transit facilities serving the project site are adequate.
- Bicycle facilities serving the projects site are expected to be adequate upon the addition of a bike rack at the Los Alamos Road parking lot.
- The existing and proposed parking supply appears to be adequate for demand with the expansion based on the site visit completed as well as visitation data provided by Sonoma County Parks.

Thank you for giving us the opportunity to provide these services.

Sincerely,

Lauren Davini, PE
Assistant Engineer

Steve Weinberger, PE, PTOE
Principal

SJW/lgd/SOX920-3.L1

Enclosures: LOS Calculations
Collision Rate Calculations
Trip Distribution Figure
Alternative Modes Figure

HCM 2010 Signalized Intersection Summary
1: Los Alamos Rd & SR 12

05/23/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	680	15	137	678	4	22	13	126	13	40	44
Future Volume (veh/h)	22	680	15	137	678	4	22	13	126	13	40	44
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	3	0	0	3	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	23	716	0	144	714	0	23	14	15	14	42	5
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	1547	692	308	1934	865	226	125	267	114	259	267
Arrive On Green	0.06	0.44	0.00	0.18	0.55	0.00	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	788	726	1583	222	1562	1583
Grp Volume(v), veh/h	23	716	0	144	714	0	37	0	15	56	0	5
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1514	0	1583	1784	0	1583
Q Serve(g_s), s	0.7	8.0	0.0	4.1	6.4	0.0	0.0	0.0	0.4	0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.7	8.0	0.0	4.1	6.4	0.0	1.5	0.0	0.4	1.5	0.0	0.1
Prop In Lane	1.00		1.00	1.00		1.00	0.62		1.00	0.25		1.00
Lane Grp Cap(c), veh/h	114	1547	692	308	1934	865	351	0	267	373	0	267
V/C Ratio(X)	0.20	0.46	0.00	0.47	0.37	0.00	0.11	0.00	0.06	0.15	0.00	0.02
Avail Cap(c_a), veh/h	379	2584	1156	348	2521	1128	951	0	888	1052	0	888
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.3	11.4	0.0	21.2	7.4	0.0	20.3	0.0	19.8	20.5	0.0	19.7
Incr Delay (d2), s/veh	0.9	0.3	0.0	1.1	0.2	0.0	0.1	0.0	0.1	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.5	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.0	0.0	2.1	3.2	0.0	0.8	0.0	0.2	1.1	0.0	0.1
LnGrp Delay(d),s/veh	26.2	11.7	0.0	22.3	7.6	0.0	21.1	0.0	19.9	21.2	0.0	19.7
LnGrp LOS	C	B		C	A		C		B	C		B
Approach Vol, veh/h		739			858			52			61	
Approach Delay, s/veh		12.1			10.1			20.7			21.1	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.8	30.7		12.6	6.6	36.9		12.6
Change Period (Y+Rc), s	3.0	6.0		3.5	3.0	6.0		3.5
Max Green Setting (Gmax), s	11.0	41.0		31.5	12.0	40.0		31.5
Max Q Clear Time (g_c+I1), s	6.1	10.0		3.5	2.7	8.4		3.5
Green Ext Time (p_c), s	0.1	14.7		0.5	0.0	14.9		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	11.7
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 2010 Signalized Intersection Summary
2: Pythian Road & SR 12

05/23/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	686	38	28	678	20	85	2	28	4	3	13
Future Volume (veh/h)	96	686	38	28	678	20	85	2	28	4	3	13
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	4	0	0	2	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	99	707	23	29	699	20	88	2	11	4	3	2
Adj No. of Lanes	1	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	224	1049	892	111	899	26	250	23	20	148	112	47
Arrive On Green	0.13	0.56	0.56	0.06	0.50	0.50	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1774	1863	1583	1774	1802	52	1203	83	157	537	774	374
Grp Volume(v), veh/h	99	707	23	29	0	719	101	0	0	9	0	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1854	1443	0	0	1685	0	0
Q Serve(g_s), s	3.4	17.5	0.4	1.0	0.0	20.9	4.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.4	17.5	0.4	1.0	0.0	20.9	4.3	0.0	0.0	0.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.87		0.11	0.44		0.22
Lane Grp Cap(c), veh/h	224	1049	892	111	0	925	298	0	0	303	0	0
V/C Ratio(X)	0.44	0.67	0.03	0.26	0.00	0.78	0.34	0.00	0.00	0.03	0.00	0.00
Avail Cap(c_a), veh/h	439	1429	1214	439	0	1422	458	0	0	482	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	26.8	10.2	6.4	29.6	0.0	13.6	26.9	0.0	0.0	25.1	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.8	0.0	1.2	0.0	1.5	0.7	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.3	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	9.2	0.2	0.5	0.0	11.1	2.3	0.0	0.0	0.3	0.0	0.0
LnGrp Delay(d),s/veh	28.2	11.0	6.4	30.9	0.0	15.1	29.6	0.0	0.0	25.4	0.0	0.0
LnGrp LOS	C	B	A	C		B	C			C		
Approach Vol, veh/h		829			748			101			9	
Approach Delay, s/veh		12.9			15.7			29.6			25.4	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.8	43.7		13.4	13.1	39.4		13.4
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	6.5		* 4.7
Max Green Setting (Gmax), s	* 16	50.5		* 16	* 16	50.5		* 16
Max Q Clear Time (g_c+I1), s	3.0	19.5		2.3	5.4	22.9		6.3
Green Ext Time (p_c), s	0.0	10.4		0.4	0.1	10.1		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	15.2
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 2010 Signalized Intersection Summary
1: Los Alamos Rd & SR 12

05/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	778	28	168	940	16	37	41	147	5	19	45
Future Volume (veh/h)	37	778	28	168	940	16	37	41	147	5	19	45
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	3	0	0	3	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	39	828	0	179	1000	0	39	44	26	5	20	9
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	166	1690	756	289	1936	866	168	171	264	92	269	264
Arrive On Green	0.09	0.48	0.00	0.16	0.55	0.00	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	590	1064	1583	160	1637	1583
Grp Volume(v), veh/h	39	828	0	179	1000	0	83	0	26	25	0	9
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1654	0	1583	1798	0	1583
Q Serve(g_s), s	1.3	10.1	0.0	6.0	11.3	0.0	0.4	0.0	0.9	0.0	0.0	0.3
Cycle Q Clear(g_c), s	1.3	10.1	0.0	6.0	11.3	0.0	2.6	0.0	0.9	0.7	0.0	0.3
Prop In Lane	1.00		1.00	1.00		1.00	0.47		1.00	0.20		1.00
Lane Grp Cap(c), veh/h	166	1690	756	289	1936	866	340	0	264	357	0	264
V/C Ratio(X)	0.24	0.49	0.00	0.62	0.52	0.00	0.24	0.00	0.10	0.07	0.00	0.03
Avail Cap(c_a), veh/h	333	2267	1014	305	2212	990	878	0	779	927	0	779
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.4	11.7	0.0	25.4	9.4	0.0	24.1	0.0	22.9	23.1	0.0	22.6
Incr Delay (d2), s/veh	0.7	0.3	0.0	3.5	0.3	0.0	0.4	0.0	0.2	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.5	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	5.2	0.0	3.3	5.7	0.0	1.7	0.0	0.4	0.7	0.0	0.1
LnGrp Delay(d),s/veh	28.1	12.0	0.0	28.9	9.7	0.0	25.2	0.0	23.0	23.7	0.0	22.7
LnGrp LOS	C	B		C	A		C		C	C		C
Approach Vol, veh/h		867			1179			109			34	
Approach Delay, s/veh		12.7			12.6			24.7			23.4	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.5	36.8		13.6	9.0	41.4		13.6
Change Period (Y+Rc), s	3.0	6.0		3.5	3.0	6.0		3.5
Max Green Setting (Gmax), s	11.0	41.0		31.5	12.0	40.0		31.5
Max Q Clear Time (g_c+I1), s	8.0	12.1		2.7	3.3	13.3		4.6
Green Ext Time (p_c), s	0.1	18.7		0.6	0.0	17.7		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 2010 Signalized Intersection Summary
2: Pythian Road & SR 12

05/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	631	111	41	747	11	63	0	39	19	1	30
Future Volume (veh/h)	24	631	111	41	747	11	63	0	39	19	1	30
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	4	0	0	2	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	25	651	61	42	770	10	65	0	12	20	1	3
Adj No. of Lanes	1	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	101	953	810	148	988	13	258	9	30	273	47	25
Arrive On Green	0.06	0.51	0.51	0.08	0.54	0.54	0.14	0.00	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1774	1863	1583	1774	1835	24	1166	69	228	1221	139	194
Grp Volume(v), veh/h	25	651	61	42	0	780	77	0	0	24	0	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1859	1463	0	0	1554	0	0
Q Serve(g_s), s	0.8	15.6	1.2	1.3	0.0	19.8	2.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.8	15.6	1.2	1.3	0.0	19.8	2.7	0.0	0.0	0.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.01	0.84		0.16	0.83		0.12
Lane Grp Cap(c), veh/h	101	953	810	148	0	1001	297	0	0	325	0	0
V/C Ratio(X)	0.25	0.68	0.08	0.28	0.00	0.78	0.26	0.00	0.00	0.07	0.00	0.00
Avail Cap(c_a), veh/h	484	1576	1339	484	0	1572	506	0	0	518	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	27.4	11.2	7.6	26.1	0.0	11.2	23.7	0.0	0.0	22.7	0.0	0.0
Incr Delay (d2), s/veh	1.3	0.9	0.0	1.0	0.0	1.4	0.5	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.3	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	8.4	0.5	0.7	0.0	10.6	1.4	0.0	0.0	0.5	0.0	0.0
LnGrp Delay(d),s/veh	28.7	12.0	7.6	27.2	0.0	12.5	25.9	0.0	0.0	23.1	0.0	0.0
LnGrp LOS	C	B	A	C		B	C			C		
Approach Vol, veh/h		737			822			77			24	
Approach Delay, s/veh		12.2			13.3			25.9			23.1	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.7	37.2		12.8	8.1	38.8		12.8
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	6.5		* 4.7
Max Green Setting (Gmax), s	* 16	50.5		* 16	* 16	50.5		* 16
Max Q Clear Time (g_c+I1), s	3.3	17.6		2.7	2.8	21.8		4.7
Green Ext Time (p_c), s	0.0	10.9		0.3	0.0	10.4		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.5
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 2010 Signalized Intersection Summary
1: Los Alamos Rd & SR 12

06/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	687	30	140	744	22	34	19	111	11	30	41
Future Volume (veh/h)	41	687	30	140	744	22	34	19	111	11	30	41
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	3	0	0	3	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	43	723	0	147	783	0	36	20	-11	12	32	4
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	184	1595	713	308	1842	824	221	111	248	117	244	248
Arrive On Green	0.10	0.45	0.00	0.18	0.52	0.00	0.15	0.15	0.00	0.15	0.15	0.15
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	837	707	1583	248	1532	1583
Grp Volume(v), veh/h	43	723	0	147	783	0	56	0	-11	44	0	4
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1544	0	1583	1781	0	1583
Q Serve(g_s), s	1.3	7.9	0.0	4.2	7.6	0.0	0.5	0.0	0.0	0.0	0.0	0.1
Cycle Q Clear(g_c), s	1.3	7.9	0.0	4.2	7.6	0.0	1.7	0.0	0.0	1.2	0.0	0.1
Prop In Lane	1.00		1.00	1.00		1.00	0.64		1.00	0.27		1.00
Lane Grp Cap(c), veh/h	184	1595	713	308	1842	824	335	0	248	354	0	248
V/C Ratio(X)	0.23	0.45	0.00	0.48	0.42	0.00	0.17	0.00	-0.04	0.12	0.00	0.02
Avail Cap(c_a), veh/h	377	2570	1150	346	2507	1122	952	0	883	1045	0	883
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.6	11.0	0.0	21.4	8.6	0.0	21.4	0.0	0.0	21.0	0.0	20.4
Incr Delay (d2), s/veh	0.6	0.3	0.0	1.1	0.2	0.0	0.2	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.6	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	4.0	0.0	2.2	3.9	0.0	1.1	0.0	0.0	1.0	0.0	0.1
LnGrp Delay(d),s/veh	24.3	11.2	0.0	22.5	8.8	0.0	22.3	0.0	0.0	21.8	0.0	20.4
LnGrp LOS	C	B		C	A		C			C		C
Approach Vol, veh/h		766			930			45			48	
Approach Delay, s/veh		12.0			11.0			27.8			21.7	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.9	31.6		11.9	8.9	35.6		11.9
Change Period (Y+Rc), s	3.0	6.0		3.5	3.0	6.0		3.5
Max Green Setting (Gmax), s	11.0	41.0		31.5	12.0	40.0		31.5
Max Q Clear Time (g_c+I1), s	6.2	9.9		3.2	3.3	9.6		3.7
Green Ext Time (p_c), s	0.1	15.7		0.5	0.0	15.5		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	12.1
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
2: Pythian Road & SR 12

06/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	523	96	46	568	24	77	1	61	16	1	20
Future Volume (veh/h)	35	523	96	46	568	24	77	1	61	16	1	20
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	4	0	0	2	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	36	539	46	47	586	24	79	1	35	16	1	-7
Adj No. of Lanes	1	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	138	815	693	168	807	33	252	40	70	73	268	0
Arrive On Green	0.08	0.44	0.44	0.09	0.46	0.46	0.16	0.16	0.16	0.16	0.16	0.00
Sat Flow, veh/h	1774	1863	1583	1774	1777	73	896	144	455	1082	1769	-1174
Grp Volume(v), veh/h	36	539	46	47	0	610	115	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1850	1496	0	0	0	0	0
Q Serve(g_s), s	1.0	11.9	0.9	1.3	0.0	13.9	2.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.0	11.9	0.9	1.3	0.0	13.9	3.5	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.69		0.30	1.60		-0.70
Lane Grp Cap(c), veh/h	138	815	693	168	0	841	362	0	0	0	0	0
V/C Ratio(X)	0.26	0.66	0.07	0.28	0.00	0.73	0.32	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	556	1809	1537	556	0	1796	581	0	0	0	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	22.8	11.7	8.6	22.2	0.0	11.7	20.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.9	0.0	0.9	0.0	1.2	0.5	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	6.3	0.4	0.7	0.0	7.3	2.0	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	23.8	12.6	8.6	23.1	0.0	12.9	21.8	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	C	B	A	C		B	C					
Approach Vol, veh/h		621			657			115			0	
Approach Delay, s/veh		13.0			13.6			21.8			0.0	
Approach LOS		B			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	29.3		13.1	8.8	30.2		13.1
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	6.5		* 4.7
Max Green Setting (Gmax), s	* 16	50.5		* 16	* 16	50.5		* 16
Max Q Clear Time (g_c+I1), s	3.3	13.9		0.0	3.0	15.9		5.5
Green Ext Time (p_c), s	0.1	7.8		0.0	0.0	7.8		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	14.0
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
1: Los Alamos Rd & SR 12

06/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	680	15	137	678	4	22	13	126	13	40	45
Future Volume (veh/h)	23	680	15	137	678	4	22	13	126	13	40	45
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	3	0	0	3	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	24	716	0	144	714	0	23	14	15	14	42	6
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	118	1546	692	308	1925	861	226	125	268	114	259	268
Arrive On Green	0.07	0.44	0.00	0.18	0.55	0.00	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	788	725	1583	222	1561	1583
Grp Volume(v), veh/h	24	716	0	144	714	0	37	0	15	56	0	6
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1513	0	1583	1784	0	1583
Q Serve(g_s), s	0.7	8.0	0.0	4.1	6.4	0.0	0.0	0.0	0.5	0.0	0.0	0.2
Cycle Q Clear(g_c), s	0.7	8.0	0.0	4.1	6.4	0.0	1.5	0.0	0.5	1.5	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	0.62		1.00	0.25		1.00
Lane Grp Cap(c), veh/h	118	1546	692	308	1925	861	352	0	268	373	0	268
V/C Ratio(X)	0.20	0.46	0.00	0.47	0.37	0.00	0.11	0.00	0.06	0.15	0.00	0.02
Avail Cap(c_a), veh/h	379	2582	1155	347	2519	1127	950	0	888	1051	0	888
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.2	11.4	0.0	21.2	7.5	0.0	20.3	0.0	19.8	20.5	0.0	19.7
Incr Delay (d2), s/veh	0.8	0.3	0.0	1.1	0.2	0.0	0.1	0.0	0.1	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.5	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.0	0.0	2.1	3.2	0.0	0.8	0.0	0.2	1.1	0.0	0.1
LnGrp Delay(d),s/veh	26.0	11.7	0.0	22.3	7.7	0.0	21.1	0.0	19.9	21.2	0.0	19.7
LnGrp LOS	C	B		C	A		C		B	C		B
Approach Vol, veh/h		740			858			52			62	
Approach Delay, s/veh		12.2			10.2			20.7			21.1	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.8	30.7		12.6	6.7	36.8		12.6
Change Period (Y+Rc), s	3.0	6.0		3.5	3.0	6.0		3.5
Max Green Setting (Gmax), s	11.0	41.0		31.5	12.0	40.0		31.5
Max Q Clear Time (g_c+I1), s	6.1	10.0		3.5	2.7	8.4		3.5
Green Ext Time (p_c), s	0.1	14.7		0.5	0.0	14.9		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	11.7
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
2: Pythian Road & SR 12

06/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	686	38	28	678	21	85	2	28	5	4	13
Future Volume (veh/h)	96	686	38	28	678	21	85	2	28	5	4	13
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	4	0	0	2	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	99	707	23	29	699	21	88	2	11	5	4	2
Adj No. of Lanes	1	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	224	1049	892	111	898	27	250	23	20	151	119	39
Arrive On Green	0.13	0.56	0.56	0.06	0.50	0.50	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1774	1863	1583	1774	1799	54	1205	83	157	558	824	307
Grp Volume(v), veh/h	99	707	23	29	0	720	101	0	0	11	0	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1853	1445	0	0	1690	0	0
Q Serve(g_s), s	3.4	17.6	0.4	1.0	0.0	21.0	3.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.4	17.6	0.4	1.0	0.0	21.0	4.3	0.0	0.0	0.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.87		0.11	0.45		0.18
Lane Grp Cap(c), veh/h	224	1049	892	111	0	925	298	0	0	305	0	0
V/C Ratio(X)	0.44	0.67	0.03	0.26	0.00	0.78	0.34	0.00	0.00	0.04	0.00	0.00
Avail Cap(c_a), veh/h	438	1425	1211	438	0	1418	457	0	0	483	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	26.9	10.2	6.4	29.7	0.0	13.6	26.9	0.0	0.0	25.1	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.8	0.0	1.2	0.0	1.5	0.7	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.3	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	9.2	0.2	0.5	0.0	11.1	2.3	0.0	0.0	0.4	0.0	0.0
LnGrp Delay(d),s/veh	28.2	11.0	6.5	30.9	0.0	15.2	29.6	0.0	0.0	25.5	0.0	0.0
LnGrp LOS	C	B	A	C		B	C			C		
Approach Vol, veh/h		829			749			101			11	
Approach Delay, s/veh		12.9			15.8			29.6			25.5	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.8	43.8		13.4	13.1	39.5		13.4
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	6.5		* 4.7
Max Green Setting (Gmax), s	* 16	50.5		* 16	* 16	50.5		* 16
Max Q Clear Time (g_c+I1), s	3.0	19.6		2.4	5.4	23.0		6.3
Green Ext Time (p_c), s	0.0	10.4		0.4	0.1	10.1		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	15.3
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
1: Los Alamos Rd & SR 12

06/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	778	28	168	940	16	37	41	147	5	19	46
Future Volume (veh/h)	38	778	28	168	940	16	37	41	147	5	19	46
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	3	0	0	3	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	40	828	0	179	1000	0	39	44	26	5	20	10
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	168	1690	756	289	1930	863	168	171	264	92	270	264
Arrive On Green	0.10	0.48	0.00	0.16	0.55	0.00	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	590	1063	1583	161	1637	1583
Grp Volume(v), veh/h	40	828	0	179	1000	0	83	0	26	25	0	10
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1653	0	1583	1798	0	1583
Q Serve(g_s), s	1.3	10.1	0.0	6.0	11.3	0.0	0.4	0.0	0.9	0.0	0.0	0.3
Cycle Q Clear(g_c), s	1.3	10.1	0.0	6.0	11.3	0.0	2.6	0.0	0.9	0.7	0.0	0.3
Prop In Lane	1.00		1.00	1.00		1.00	0.47		1.00	0.20		1.00
Lane Grp Cap(c), veh/h	168	1690	756	289	1930	863	341	0	264	357	0	264
V/C Ratio(X)	0.24	0.49	0.00	0.62	0.52	0.00	0.24	0.00	0.10	0.07	0.00	0.04
Avail Cap(c_a), veh/h	333	2267	1014	305	2211	989	877	0	779	927	0	779
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.3	11.7	0.0	25.4	9.5	0.0	24.1	0.0	22.9	23.1	0.0	22.6
Incr Delay (d2), s/veh	0.7	0.3	0.0	3.5	0.3	0.0	0.4	0.0	0.2	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.5	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	5.2	0.0	3.3	5.7	0.0	1.7	0.0	0.4	0.7	0.0	0.2
LnGrp Delay(d),s/veh	28.0	12.0	0.0	28.9	9.8	0.0	25.2	0.0	23.0	23.7	0.0	22.7
LnGrp LOS	C	B		C	A		C		C	C		C
Approach Vol, veh/h		868			1179			109			35	
Approach Delay, s/veh		12.7			12.7			24.7			23.4	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.5	36.8		13.7	9.1	41.3		13.7
Change Period (Y+Rc), s	3.0	6.0		3.5	3.0	6.0		3.5
Max Green Setting (Gmax), s	11.0	41.0		31.5	12.0	40.0		31.5
Max Q Clear Time (g_c+I1), s	8.0	12.1		2.7	3.3	13.3		4.6
Green Ext Time (p_c), s	0.1	18.7		0.7	0.0	17.7		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	13.5
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
2: Pythian Road & SR 12

06/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	631	111	41	747	12	63	1	39	20	1	30
Future Volume (veh/h)	24	631	111	41	747	12	63	1	39	20	1	30
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	4	0	0	2	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	25	651	61	42	770	11	65	1	12	21	1	3
Adj No. of Lanes	1	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	101	955	812	149	989	14	258	24	30	275	30	25
Arrive On Green	0.06	0.51	0.51	0.08	0.54	0.54	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1774	1863	1583	1774	1832	26	1150	93	226	1233	133	186
Grp Volume(v), veh/h	25	651	61	42	0	781	78	0	0	25	0	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1858	1468	0	0	1553	0	0
Q Serve(g_s), s	0.8	15.6	1.2	1.3	0.0	19.9	2.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.8	15.6	1.2	1.3	0.0	19.9	2.8	0.0	0.0	0.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.01	0.83		0.15	0.84		0.12
Lane Grp Cap(c), veh/h	101	955	812	149	0	1003	317	0	0	326	0	0
V/C Ratio(X)	0.25	0.68	0.08	0.28	0.00	0.78	0.25	0.00	0.00	0.08	0.00	0.00
Avail Cap(c_a), veh/h	483	1571	1335	483	0	1567	505	0	0	517	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	27.2	11.0	7.5	25.9	0.0	11.0	23.7	0.0	0.0	22.7	0.0	0.0
Incr Delay (d2), s/veh	1.3	0.9	0.0	1.0	0.0	1.3	0.4	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.3	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	8.3	0.5	0.7	0.0	10.5	1.7	0.0	0.0	0.6	0.0	0.0
LnGrp Delay(d),s/veh	28.5	11.9	7.5	27.0	0.0	12.4	25.6	0.0	0.0	23.1	0.0	0.0
LnGrp LOS	C	B	A	C		B	C			C		
Approach Vol, veh/h		737			823			78			25	
Approach Delay, s/veh		12.1			13.1			25.6			23.1	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.7	37.3		12.9	8.1	38.9		12.9
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	6.5		* 4.7
Max Green Setting (Gmax), s	* 16	50.5		* 16	* 16	50.5		* 16
Max Q Clear Time (g_c+I1), s	3.3	17.6		2.7	2.8	21.9		4.8
Green Ext Time (p_c), s	0.0	10.9		0.3	0.0	10.4		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
1: Los Alamos Rd & SR 12

06/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	687	30	140	744	22	34	19	111	11	30	43
Future Volume (veh/h)	43	687	30	140	744	22	34	19	111	11	30	43
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	3	0	0	3	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	45	723	0	147	783	0	36	20	-11	12	32	6
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	190	1593	712	308	1828	818	222	112	250	117	245	250
Arrive On Green	0.11	0.45	0.00	0.18	0.52	0.00	0.15	0.15	0.00	0.15	0.15	0.15
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	837	705	1583	250	1531	1583
Grp Volume(v), veh/h	45	723	0	147	783	0	56	0	-11	44	0	6
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1542	0	1583	1780	0	1583
Q Serve(g_s), s	1.3	7.9	0.0	4.2	7.7	0.0	0.5	0.0	0.0	0.0	0.0	0.2
Cycle Q Clear(g_c), s	1.3	7.9	0.0	4.2	7.7	0.0	1.7	0.0	0.0	1.2	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	0.64		1.00	0.27		1.00
Lane Grp Cap(c), veh/h	190	1593	712	308	1828	818	336	0	250	356	0	250
V/C Ratio(X)	0.24	0.45	0.00	0.48	0.43	0.00	0.17	0.00	-0.04	0.12	0.00	0.02
Avail Cap(c_a), veh/h	376	2565	1148	345	2503	1120	950	0	882	1043	0	882
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.5	11.0	0.0	21.4	8.7	0.0	21.4	0.0	0.0	21.0	0.0	20.4
Incr Delay (d2), s/veh	0.6	0.3	0.0	1.1	0.2	0.0	0.2	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.6	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	4.0	0.0	2.2	3.9	0.0	1.1	0.0	0.0	1.0	0.0	0.1
LnGrp Delay(d),s/veh	24.2	11.3	0.0	22.6	9.0	0.0	22.3	0.0	0.0	21.7	0.0	20.4
LnGrp LOS	C	B		C	A		C			C		C
Approach Vol, veh/h		768			930			45			50	
Approach Delay, s/veh		12.0			11.1			27.7			21.6	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.9	31.6		12.0	9.1	35.5		12.0
Change Period (Y+Rc), s	3.0	6.0		3.5	3.0	6.0		3.5
Max Green Setting (Gmax), s	11.0	41.0		31.5	12.0	40.0		31.5
Max Q Clear Time (g_c+I1), s	6.2	9.9		3.2	3.3	9.7		3.7
Green Ext Time (p_c), s	0.1	15.7		0.5	0.0	15.5		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	12.2
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
2: Pythian Road & SR 12

06/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	523	96	46	568	26	77	2	61	18	2	20
Future Volume (veh/h)	35	523	96	46	568	26	77	2	61	18	2	20
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	4	0	0	2	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	36	539	46	47	586	26	79	2	35	19	2	-7
Adj No. of Lanes	1	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	138	816	694	167	805	36	251	42	70	72	256	0
Arrive On Green	0.08	0.44	0.44	0.09	0.46	0.46	0.16	0.16	0.16	0.16	0.16	0.00
Sat Flow, veh/h	1774	1863	1583	1774	1770	79	889	158	452	995	1473	-823
Grp Volume(v), veh/h	36	539	46	47	0	612	116	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1849	1499	0	0	0	0	0
Q Serve(g_s), s	1.0	11.9	0.9	1.3	0.0	14.1	2.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.0	11.9	0.9	1.3	0.0	14.1	3.6	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.68		0.30	1.36		-0.50
Lane Grp Cap(c), veh/h	138	816	694	167	0	841	363	0	0	0	0	0
V/C Ratio(X)	0.26	0.66	0.07	0.28	0.00	0.73	0.32	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	553	1797	1528	553	0	1784	578	0	0	0	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	23.0	11.8	8.6	22.3	0.0	11.8	20.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.9	0.0	0.9	0.0	1.2	0.5	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	6.3	0.4	0.7	0.0	7.5	2.0	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	24.0	12.7	8.7	23.2	0.0	13.0	21.8	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	C	B	A	C		B	C					
Approach Vol, veh/h		621			659			116			0	
Approach Delay, s/veh		13.0			13.7			21.8			0.0	
Approach LOS		B			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.7	29.5		13.2	8.8	30.4		13.2
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	6.5		* 4.7
Max Green Setting (Gmax), s	* 16	50.5		* 16	* 16	50.5		* 16
Max Q Clear Time (g_c+I1), s	3.3	13.9		0.0	3.0	16.1		5.6
Green Ext Time (p_c), s	0.1	7.9		0.0	0.0	7.8		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	14.1
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
1: Los Alamos Rd & SR 12

05/23/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	703	55	185	862	4	34	13	126	13	48	50
Future Volume (veh/h)	24	703	55	185	862	4	34	13	126	13	48	50
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	3	0	0	3	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	24	703	0	185	862	0	34	13	14	13	48	11
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	117	1572	703	310	1958	876	239	86	273	101	274	273
Arrive On Green	0.07	0.45	0.00	0.18	0.56	0.00	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	870	478	1583	177	1624	1583
Grp Volume(v), veh/h	24	703	0	185	862	0	47	0	14	61	0	11
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1348	0	1583	1801	0	1583
Q Serve(g_s), s	0.8	8.1	0.0	5.7	8.4	0.0	0.7	0.0	0.4	0.0	0.0	0.3
Cycle Q Clear(g_c), s	0.8	8.1	0.0	5.7	8.4	0.0	2.4	0.0	0.4	1.7	0.0	0.3
Prop In Lane	1.00		1.00	1.00		1.00	0.72		1.00	0.21		1.00
Lane Grp Cap(c), veh/h	117	1572	703	310	1958	876	327	0	273	373	0	273
V/C Ratio(X)	0.21	0.45	0.00	0.60	0.44	0.00	0.14	0.00	0.05	0.16	0.00	0.04
Avail Cap(c_a), veh/h	359	2449	1096	329	2389	1069	859	0	842	1006	0	842
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.6	11.7	0.0	22.9	8.1	0.0	21.8	0.0	20.7	21.5	0.0	20.7
Incr Delay (d2), s/veh	0.9	0.3	0.0	2.6	0.2	0.0	0.2	0.0	0.1	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.6	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.1	0.0	3.1	4.3	0.0	1.0	0.0	0.2	1.2	0.0	0.2
LnGrp Delay(d),s/veh	27.5	12.0	0.0	25.5	8.3	0.0	22.7	0.0	20.8	22.3	0.0	20.7
LnGrp LOS	C	B		C	A		C		C	C		C
Approach Vol, veh/h		727			1047			61			72	
Approach Delay, s/veh		12.5			11.3			22.3			22.1	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.5	32.5		13.3	6.9	39.1		13.3
Change Period (Y+Rc), s	3.0	6.0		3.5	3.0	6.0		3.5
Max Green Setting (Gmax), s	11.0	41.0		31.5	12.0	40.0		31.5
Max Q Clear Time (g_c+I1), s	7.7	10.1		3.7	2.8	10.4		4.4
Green Ext Time (p_c), s	0.1	16.4		0.6	0.0	16.0		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	12.5
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 2010 Signalized Intersection Summary
2: Pythian Road & SR 12

05/23/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	757	38	69	712	20	85	2	70	67	14	25
Future Volume (veh/h)	96	757	38	69	712	20	85	2	70	67	14	25
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	4	0	0	2	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	96	757	22	69	712	19	85	2	53	67	14	14
Adj No. of Lanes	1	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	215	966	821	188	909	24	195	33	82	229	62	32
Arrive On Green	0.12	0.52	0.52	0.11	0.50	0.50	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1774	1863	1583	1774	1806	48	839	137	595	1010	341	234
Grp Volume(v), veh/h	96	757	22	69	0	731	140	0	0	95	0	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1854	1571	0	0	1585	0	0
Q Serve(g_s), s	3.5	22.7	0.5	2.5	0.0	22.3	2.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.5	22.7	0.5	2.5	0.0	22.3	5.4	0.0	0.0	3.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.61		0.38	0.71		0.15
Lane Grp Cap(c), veh/h	215	966	821	188	0	933	315	0	0	319	0	0
V/C Ratio(X)	0.45	0.78	0.03	0.37	0.00	0.78	0.45	0.00	0.00	0.30	0.00	0.00
Avail Cap(c_a), veh/h	419	1364	1159	419	0	1358	444	0	0	450	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	28.3	13.6	8.2	28.9	0.0	14.2	27.8	0.0	0.0	26.9	0.0	0.0
Incr Delay (d2), s/veh	1.4	2.0	0.0	1.2	0.0	1.9	1.0	0.0	0.0	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.4	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	12.2	0.2	1.3	0.0	11.8	3.1	0.0	0.0	1.9	0.0	0.0
LnGrp Delay(d),s/veh	29.8	15.6	8.2	30.1	0.0	16.0	30.9	0.0	0.0	27.8	0.0	0.0
LnGrp LOS	C	B	A	C		B	C			C		
Approach Vol, veh/h		875			800			140			95	
Approach Delay, s/veh		16.9			17.3			30.9			27.8	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.0	42.3		14.6	13.1	41.3		14.6
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	6.5		* 4.7
Max Green Setting (Gmax), s	* 16	50.5		* 16	* 16	50.5		* 16
Max Q Clear Time (g_c+I1), s	4.5	24.7		5.5	5.5	24.3		7.4
Green Ext Time (p_c), s	0.1	10.4		0.9	0.1	10.5		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	18.6
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 2010 Signalized Intersection Summary
1: Los Alamos Rd & SR 12

05/23/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	895	34	196	958	17	39	46	165	5	23	48
Future Volume (veh/h)	42	895	34	196	958	17	39	46	165	5	23	48
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	3	0	0	3	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	42	895	0	196	958	0	39	46	43	5	23	11
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	173	1704	762	287	1930	864	164	176	267	85	277	267
Arrive On Green	0.10	0.49	0.00	0.16	0.55	0.00	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	575	1081	1583	134	1671	1583
Grp Volume(v), veh/h	42	895	0	196	958	0	85	0	43	28	0	11
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1655	0	1583	1805	0	1583
Q Serve(g_s), s	1.4	11.4	0.0	6.8	10.9	0.0	0.4	0.0	1.5	0.0	0.0	0.4
Cycle Q Clear(g_c), s	1.4	11.4	0.0	6.8	10.9	0.0	2.7	0.0	1.5	0.8	0.0	0.4
Prop In Lane	1.00		1.00	1.00		1.00	0.46		1.00	0.18		1.00
Lane Grp Cap(c), veh/h	173	1704	762	287	1930	864	341	0	267	358	0	267
V/C Ratio(X)	0.24	0.53	0.00	0.68	0.50	0.00	0.25	0.00	0.16	0.08	0.00	0.04
Avail Cap(c_a), veh/h	325	2218	992	298	2164	968	859	0	762	910	0	762
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.8	12.1	0.0	26.3	9.5	0.0	24.6	0.0	23.5	23.5	0.0	23.1
Incr Delay (d2), s/veh	0.7	0.4	0.0	6.0	0.3	0.0	0.4	0.0	0.3	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.5	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	5.7	0.0	3.9	5.4	0.0	1.7	0.0	0.7	0.8	0.0	0.2
LnGrp Delay(d),s/veh	28.5	12.4	0.0	32.4	9.8	0.0	25.7	0.0	23.8	24.2	0.0	23.1
LnGrp LOS	C	B		C	A		C		C	C		C
Approach Vol, veh/h		937			1154			128			39	
Approach Delay, s/veh		13.1			13.7			25.1			23.9	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.7	37.8		14.0	9.4	42.0		14.0
Change Period (Y+Rc), s	3.0	6.0		3.5	3.0	6.0		3.5
Max Green Setting (Gmax), s	11.0	41.0		31.5	12.0	40.0		31.5
Max Q Clear Time (g_c+I1), s	8.8	13.4		2.8	3.4	12.9		4.7
Green Ext Time (p_c), s	0.1	18.4		0.7	0.0	18.1		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	14.3
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 2010 Signalized Intersection Summary
2: Pythian Road & SR 12

05/23/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	683	111	85	768	37	63	0	94	20	1	30
Future Volume (veh/h)	30	683	111	85	768	37	63	0	94	20	1	30
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	4	0	0	2	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	30	683	60	85	768	36	63	0	67	20	1	3
Adj No. of Lanes	1	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	918	780	212	967	45	163	21	112	267	45	25
Arrive On Green	0.06	0.49	0.49	0.12	0.55	0.55	0.14	0.00	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1774	1863	1583	1774	1765	83	594	148	789	1191	127	188
Grp Volume(v), veh/h	30	683	60	85	0	804	130	0	0	24	0	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1848	1531	0	0	1507	0	0
Q Serve(g_s), s	1.1	19.2	1.3	2.9	0.0	22.7	3.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.1	19.2	1.3	2.9	0.0	22.7	5.1	0.0	0.0	0.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.48		0.52	0.83		0.12
Lane Grp Cap(c), veh/h	114	918	780	212	0	1012	296	0	0	319	0	0
V/C Ratio(X)	0.26	0.74	0.08	0.40	0.00	0.79	0.44	0.00	0.00	0.08	0.00	0.00
Avail Cap(c_a), veh/h	441	1435	1219	441	0	1423	458	0	0	461	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	29.6	13.5	8.9	27.0	0.0	12.0	26.2	0.0	0.0	24.5	0.0	0.0
Incr Delay (d2), s/veh	1.2	1.2	0.0	1.2	0.0	2.1	1.0	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.3	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	10.1	0.6	1.5	0.0	12.2	2.5	0.0	0.0	0.6	0.0	0.0
LnGrp Delay(d),s/veh	30.8	14.7	8.9	28.3	0.0	14.2	29.6	0.0	0.0	24.9	0.0	0.0
LnGrp LOS	C	B	A	C		B	C			C		
Approach Vol, veh/h		773			889			130			24	
Approach Delay, s/veh		14.9			15.5			29.6			24.9	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.6	38.9		14.1	8.9	42.6		14.1
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	6.5		* 4.7
Max Green Setting (Gmax), s	* 16	50.5		* 16	* 16	50.5		* 16
Max Q Clear Time (g_c+I1), s	4.9	21.2		2.8	3.1	24.7		7.1
Green Ext Time (p_c), s	0.1	11.2		0.6	0.0	10.6		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 2010 Signalized Intersection Summary
1: Los Alamos Rd & SR 12

05/23/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	769	34	162	863	26	37	21	121	12	32	44
Future Volume (veh/h)	44	769	34	162	863	26	37	21	121	12	32	44
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	3	0	0	3	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	44	769	0	162	863	0	37	21	26	12	32	9
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	183	1619	724	298	1848	827	225	118	271	116	252	271
Arrive On Green	0.10	0.46	0.00	0.17	0.53	0.00	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	843	690	1583	264	1499	1583
Grp Volume(v), veh/h	44	769	0	162	863	0	58	0	26	44	0	9
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1533	0	1583	1763	0	1583
Q Serve(g_s), s	1.4	9.1	0.0	5.1	9.3	0.0	0.6	0.0	0.8	0.0	0.0	0.3
Cycle Q Clear(g_c), s	1.4	9.1	0.0	5.1	9.3	0.0	1.9	0.0	0.8	1.2	0.0	0.3
Prop In Lane	1.00		1.00	1.00		1.00	0.64		1.00	0.27		1.00
Lane Grp Cap(c), veh/h	183	1619	724	298	1848	827	345	0	271	367	0	271
V/C Ratio(X)	0.24	0.47	0.00	0.54	0.47	0.00	0.17	0.00	0.10	0.12	0.00	0.03
Avail Cap(c_a), veh/h	351	2392	1070	322	2334	1044	884	0	822	965	0	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.4	11.7	0.0	23.5	9.4	0.0	22.3	0.0	21.4	21.9	0.0	21.2
Incr Delay (d2), s/veh	0.7	0.3	0.0	1.6	0.3	0.0	0.2	0.0	0.2	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.5	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	4.6	0.0	2.7	4.6	0.0	1.2	0.0	0.4	1.0	0.0	0.1
LnGrp Delay(d),s/veh	26.1	12.0	0.0	25.1	9.7	0.0	23.2	0.0	21.6	22.6	0.0	21.3
LnGrp LOS	C	B		C	A		C		C	C		C
Approach Vol, veh/h		813			1025			84			53	
Approach Delay, s/veh		12.7			12.1			22.7			22.4	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.3	34.0		13.4	9.3	38.0		13.4
Change Period (Y+Rc), s	3.0	6.0		3.5	3.0	6.0		3.5
Max Green Setting (Gmax), s	11.0	41.0		31.5	12.0	40.0		31.5
Max Q Clear Time (g_c+I1), s	7.1	11.1		3.2	3.4	11.3		3.9
Green Ext Time (p_c), s	0.1	16.9		0.6	0.0	16.5		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	13.1
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 2010 Signalized Intersection Summary
2: Pythian Road & SR 12

05/23/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	565	104	51	630	27	112	4	89	32	4	40
Future Volume (veh/h)	38	565	104	51	630	27	112	4	89	32	4	40
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	4	0	0	4	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	38	565	53	51	630	26	112	4	62	32	4	13
Adj No. of Lanes	1	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	140	845	718	172	837	35	238	38	86	251	62	68
Arrive On Green	0.08	0.45	0.45	0.10	0.47	0.47	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1774	1863	1583	1774	1776	73	853	128	524	904	255	418
Grp Volume(v), veh/h	38	565	53	51	0	656	178	0	0	49	0	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1850	1505	0	0	1577	0	0
Q Serve(g_s), s	1.2	13.6	1.1	1.5	0.0	16.6	4.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.2	13.6	1.1	1.5	0.0	16.6	6.2	0.0	0.0	1.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.63		0.35	0.65		0.27
Lane Grp Cap(c), veh/h	140	845	718	172	0	872	364	0	0	377	0	0
V/C Ratio(X)	0.27	0.67	0.07	0.30	0.00	0.75	0.49	0.00	0.00	0.13	0.00	0.00
Avail Cap(c_a), veh/h	506	1646	1399	506	0	1635	527	0	0	536	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	25.0	12.4	8.9	24.2	0.0	12.5	22.4	0.0	0.0	20.5	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.9	0.0	1.0	0.0	1.3	1.0	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.9	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	7.2	0.5	0.8	0.0	8.8	3.2	0.0	0.0	1.1	0.0	0.0
LnGrp Delay(d),s/veh	26.0	13.3	9.0	25.2	0.0	13.8	25.2	0.0	0.0	21.6	0.0	0.0
LnGrp LOS	C	B	A	C		B	C			C		
Approach Vol, veh/h		656			707			178			49	
Approach Delay, s/veh		13.7			14.7			25.2			21.6	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.2	32.5		14.4	9.2	33.5		14.4
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	6.5		* 4.7
Max Green Setting (Gmax), s	* 16	50.5		* 16	* 16	50.5		* 16
Max Q Clear Time (g_c+I1), s	3.5	15.6		3.4	3.2	18.6		8.2
Green Ext Time (p_c), s	0.1	8.6		1.0	0.0	8.4		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	15.6
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 2010 Signalized Intersection Summary
1: Los Alamos Rd & SR 12

06/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	703	55	185	862	4	34	13	126	13	48	51
Future Volume (veh/h)	25	703	55	185	862	4	34	13	126	13	48	51
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	3	0	0	3	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	25	703	0	185	862	0	34	13	14	13	48	12
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	121	1571	703	310	1949	872	239	86	273	101	274	273
Arrive On Green	0.07	0.45	0.00	0.18	0.56	0.00	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	870	478	1583	177	1624	1583
Grp Volume(v), veh/h	25	703	0	185	862	0	47	0	14	61	0	12
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1347	0	1583	1800	0	1583
Q Serve(g_s), s	0.8	8.1	0.0	5.7	8.5	0.0	0.7	0.0	0.4	0.0	0.0	0.4
Cycle Q Clear(g_c), s	0.8	8.1	0.0	5.7	8.5	0.0	2.4	0.0	0.4	1.7	0.0	0.4
Prop In Lane	1.00		1.00	1.00		1.00	0.72		1.00	0.21		1.00
Lane Grp Cap(c), veh/h	121	1571	703	310	1949	872	327	0	273	374	0	273
V/C Ratio(X)	0.21	0.45	0.00	0.60	0.44	0.00	0.14	0.00	0.05	0.16	0.00	0.04
Avail Cap(c_a), veh/h	359	2448	1095	329	2388	1068	858	0	841	1006	0	841
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.5	11.7	0.0	22.9	8.1	0.0	21.8	0.0	20.7	21.5	0.0	20.7
Incr Delay (d2), s/veh	0.8	0.3	0.0	2.6	0.2	0.0	0.2	0.0	0.1	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.6	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.1	0.0	3.1	4.3	0.0	1.0	0.0	0.2	1.2	0.0	0.2
LnGrp Delay(d),s/veh	27.4	12.0	0.0	25.6	8.4	0.0	22.7	0.0	20.8	22.3	0.0	20.7
LnGrp LOS	C	B		C	A		C		C	C		C
Approach Vol, veh/h		728			1047			61			73	
Approach Delay, s/veh		12.5			11.4			22.3			22.0	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.5	32.5		13.3	7.0	38.9		13.3
Change Period (Y+Rc), s	3.0	6.0		3.5	3.0	6.0		3.5
Max Green Setting (Gmax), s	11.0	41.0		31.5	12.0	40.0		31.5
Max Q Clear Time (g_c+I1), s	7.7	10.1		3.7	2.8	10.5		4.4
Green Ext Time (p_c), s	0.1	16.4		0.6	0.0	16.0		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	12.6
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
2: Pythian Road & SR 12

06/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	757	38	69	712	21	85	2	70	68	15	25
Future Volume (veh/h)	96	757	38	69	712	21	85	2	70	68	15	25
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	4	0	0	2	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	96	757	22	69	712	20	85	2	53	68	15	14
Adj No. of Lanes	1	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	215	967	822	188	908	26	195	33	82	228	64	32
Arrive On Green	0.12	0.52	0.52	0.11	0.50	0.50	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1774	1863	1583	1774	1803	51	840	137	595	1004	355	229
Grp Volume(v), veh/h	96	757	22	69	0	732	140	0	0	97	0	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1854	1573	0	0	1588	0	0
Q Serve(g_s), s	3.5	22.7	0.5	2.5	0.0	22.3	1.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.5	22.7	0.5	2.5	0.0	22.3	5.4	0.0	0.0	3.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.61		0.38	0.70		0.14
Lane Grp Cap(c), veh/h	215	967	822	188	0	934	315	0	0	319	0	0
V/C Ratio(X)	0.45	0.78	0.03	0.37	0.00	0.78	0.45	0.00	0.00	0.30	0.00	0.00
Avail Cap(c_a), veh/h	419	1362	1158	419	0	1356	444	0	0	450	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	28.4	13.5	8.2	28.9	0.0	14.2	27.9	0.0	0.0	27.0	0.0	0.0
Incr Delay (d2), s/veh	1.4	2.0	0.0	1.2	0.0	1.9	1.0	0.0	0.0	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.4	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	12.2	0.2	1.3	0.0	12.0	3.1	0.0	0.0	1.9	0.0	0.0
LnGrp Delay(d),s/veh	29.8	15.5	8.2	30.1	0.0	16.1	30.9	0.0	0.0	27.9	0.0	0.0
LnGrp LOS	C	B	A	C		B	C			C		
Approach Vol, veh/h		875			801			140			97	
Approach Delay, s/veh		16.9			17.3			30.9			27.9	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.0	42.4		14.6	13.1	41.3		14.6
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	6.5		* 4.7
Max Green Setting (Gmax), s	* 16	50.5		* 16	* 16	50.5		* 16
Max Q Clear Time (g_c+I1), s	4.5	24.7		5.5	5.5	24.3		7.4
Green Ext Time (p_c), s	0.1	10.5		0.9	0.1	10.5		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	18.7
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
1: Los Alamos Rd & SR 12

06/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	895	34	196	958	17	39	46	165	5	23	49
Future Volume (veh/h)	43	895	34	196	958	17	39	46	165	5	23	49
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	3	0	0	3	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	43	895	0	196	958	0	39	46	43	5	23	12
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	176	1703	762	287	1925	861	164	176	267	85	277	267
Arrive On Green	0.10	0.49	0.00	0.16	0.55	0.00	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	575	1080	1583	134	1670	1583
Grp Volume(v), veh/h	43	895	0	196	958	0	85	0	43	28	0	12
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1655	0	1583	1805	0	1583
Q Serve(g_s), s	1.5	11.4	0.0	6.8	10.9	0.0	0.4	0.0	1.5	0.0	0.0	0.4
Cycle Q Clear(g_c), s	1.5	11.4	0.0	6.8	10.9	0.0	2.7	0.0	1.5	0.8	0.0	0.4
Prop In Lane	1.00		1.00	1.00		1.00	0.46		1.00	0.18		1.00
Lane Grp Cap(c), veh/h	176	1703	762	287	1925	861	341	0	267	358	0	267
V/C Ratio(X)	0.24	0.53	0.00	0.68	0.50	0.00	0.25	0.00	0.16	0.08	0.00	0.04
Avail Cap(c_a), veh/h	325	2218	992	298	2164	968	859	0	762	910	0	762
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.7	12.1	0.0	26.3	9.6	0.0	24.5	0.0	23.5	23.5	0.0	23.1
Incr Delay (d2), s/veh	0.7	0.4	0.0	6.0	0.3	0.0	0.4	0.0	0.3	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.5	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	5.7	0.0	3.9	5.6	0.0	1.7	0.0	0.7	0.8	0.0	0.2
LnGrp Delay(d),s/veh	28.4	12.4	0.0	32.4	9.9	0.0	25.7	0.0	23.8	24.2	0.0	23.1
LnGrp LOS	C	B		C	A		C		C	C		C
Approach Vol, veh/h		938			1154			128			40	
Approach Delay, s/veh		13.2			13.7			25.1			23.9	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.7	37.8		14.0	9.5	41.9		14.0
Change Period (Y+Rc), s	3.0	6.0		3.5	3.0	6.0		3.5
Max Green Setting (Gmax), s	11.0	41.0		31.5	12.0	40.0		31.5
Max Q Clear Time (g_c+I1), s	8.8	13.4		2.8	3.5	12.9		4.7
Green Ext Time (p_c), s	0.1	18.4		0.7	0.0	18.1		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	14.3
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
2: Pythian Road & SR 12

06/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	683	111	85	768	38	63	1	94	21	1	30
Future Volume (veh/h)	30	683	111	85	768	38	63	1	94	21	1	30
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	4	0	0	2	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	30	683	60	85	768	37	63	1	67	21	1	3
Adj No. of Lanes	1	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	919	781	212	968	47	160	35	109	268	31	25
Arrive On Green	0.06	0.49	0.49	0.12	0.55	0.55	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1774	1863	1583	1774	1763	85	590	159	784	1197	122	180
Grp Volume(v), veh/h	30	683	60	85	0	805	131	0	0	25	0	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1848	1533	0	0	1499	0	0
Q Serve(g_s), s	1.1	19.2	1.3	2.9	0.0	22.8	3.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.1	19.2	1.3	2.9	0.0	22.8	5.1	0.0	0.0	0.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.05	0.48		0.51	0.84		0.12
Lane Grp Cap(c), veh/h	114	919	781	212	0	1014	308	0	0	318	0	0
V/C Ratio(X)	0.26	0.74	0.08	0.40	0.00	0.79	0.43	0.00	0.00	0.08	0.00	0.00
Avail Cap(c_a), veh/h	441	1434	1219	441	0	1422	458	0	0	460	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	29.4	13.4	8.8	26.9	0.0	11.9	26.5	0.0	0.0	24.5	0.0	0.0
Incr Delay (d2), s/veh	1.2	1.2	0.0	1.2	0.0	2.1	0.9	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.3	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	10.1	0.6	1.5	0.0	12.1	2.8	0.0	0.0	0.6	0.0	0.0
LnGrp Delay(d),s/veh	30.6	14.6	8.9	28.1	0.0	14.1	29.5	0.0	0.0	25.0	0.0	0.0
LnGrp LOS	C	B	A	C		B	C			C		
Approach Vol, veh/h		773			890			131			25	
Approach Delay, s/veh		14.8			15.4			29.5			25.0	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.6	38.9		14.1	8.9	42.6		14.1
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	6.5		* 4.7
Max Green Setting (Gmax), s	* 16	50.5		* 16	* 16	50.5		* 16
Max Q Clear Time (g_c+I1), s	4.9	21.2		2.8	3.1	24.8		7.1
Green Ext Time (p_c), s	0.1	11.2		0.6	0.0	10.6		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	16.3
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
1: Los Alamos Rd & SR 12

06/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	769	34	162	863	26	37	21	121	12	32	46
Future Volume (veh/h)	46	769	34	162	863	26	37	21	121	12	32	46
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	3	0	0	3	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	46	769	0	162	863	0	37	21	26	12	32	11
Adj No. of Lanes	1	2	1	1	2	1	0	1	1	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	188	1618	724	297	1836	821	226	119	272	117	253	272
Arrive On Green	0.11	0.46	0.00	0.17	0.52	0.00	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1774	3539	1583	1774	3539	1583	842	689	1583	264	1499	1583
Grp Volume(v), veh/h	46	769	0	162	863	0	58	0	26	44	0	11
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1583	1531	0	1583	1763	0	1583
Q Serve(g_s), s	1.4	9.1	0.0	5.1	9.3	0.0	0.6	0.0	0.8	0.0	0.0	0.4
Cycle Q Clear(g_c), s	1.4	9.1	0.0	5.1	9.3	0.0	1.9	0.0	0.8	1.2	0.0	0.4
Prop In Lane	1.00		1.00	1.00		1.00	0.64		1.00	0.27		1.00
Lane Grp Cap(c), veh/h	188	1618	724	297	1836	821	346	0	272	367	0	272
V/C Ratio(X)	0.24	0.48	0.00	0.54	0.47	0.00	0.17	0.00	0.10	0.12	0.00	0.04
Avail Cap(c_a), veh/h	351	2390	1069	321	2332	1043	883	0	822	964	0	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.3	11.7	0.0	23.6	9.6	0.0	22.3	0.0	21.4	21.9	0.0	21.2
Incr Delay (d2), s/veh	0.7	0.3	0.0	1.6	0.3	0.0	0.2	0.0	0.2	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.5	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	4.6	0.0	2.7	4.8	0.0	1.2	0.0	0.4	1.0	0.0	0.2
LnGrp Delay(d),s/veh	26.0	12.0	0.0	25.2	9.8	0.0	23.2	0.0	21.6	22.6	0.0	21.3
LnGrp LOS	C	B		C	A		C		C	C		C
Approach Vol, veh/h		815			1025			84			55	
Approach Delay, s/veh		12.8			12.3			22.7			22.3	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.3	34.0		13.4	9.5	37.8		13.4
Change Period (Y+Rc), s	3.0	6.0		3.5	3.0	6.0		3.5
Max Green Setting (Gmax), s	11.0	41.0		31.5	12.0	40.0		31.5
Max Q Clear Time (g_c+I1), s	7.1	11.1		3.2	3.4	11.3		3.9
Green Ext Time (p_c), s	0.1	16.9		0.6	0.0	16.5		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	13.2
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
2: Pythian Road & SR 12

06/02/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	565	104	51	630	29	112	5	89	34	5	40
Future Volume (veh/h)	38	565	104	51	630	29	112	5	89	34	5	40
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	4	0	0	4	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	38	565	53	51	630	28	112	5	62	34	5	13
Adj No. of Lanes	1	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	140	847	720	172	836	37	237	39	85	250	66	64
Arrive On Green	0.08	0.46	0.46	0.10	0.47	0.47	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1774	1863	1583	1774	1770	79	851	136	523	904	278	394
Grp Volume(v), veh/h	38	565	53	51	0	658	179	0	0	52	0	0
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1849	1509	0	0	1576	0	0
Q Serve(g_s), s	1.2	13.6	1.1	1.5	0.0	16.7	4.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.2	13.6	1.1	1.5	0.0	16.7	6.3	0.0	0.0	1.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.63		0.35	0.65		0.25
Lane Grp Cap(c), veh/h	140	847	720	172	0	873	364	0	0	376	0	0
V/C Ratio(X)	0.27	0.67	0.07	0.30	0.00	0.75	0.49	0.00	0.00	0.14	0.00	0.00
Avail Cap(c_a), veh/h	505	1642	1395	505	0	1629	526	0	0	535	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	25.1	12.4	8.9	24.3	0.0	12.5	22.5	0.0	0.0	20.6	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.9	0.0	1.0	0.0	1.3	1.0	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.9	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	7.2	0.5	0.8	0.0	8.8	3.3	0.0	0.0	1.1	0.0	0.0
LnGrp Delay(d),s/veh	26.1	13.3	9.0	25.2	0.0	13.9	25.2	0.0	0.0	21.7	0.0	0.0
LnGrp LOS	C	B	A	C		B	C			C		
Approach Vol, veh/h		656			709			179			52	
Approach Delay, s/veh		13.7			14.7			25.2			21.7	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.3	32.6		14.4	9.2	33.6		14.4
Change Period (Y+Rc), s	* 4.7	6.5		* 4.7	* 4.7	6.5		* 4.7
Max Green Setting (Gmax), s	* 16	50.5		* 16	* 16	50.5		* 16
Max Q Clear Time (g_c+I1), s	3.5	15.6		3.5	3.2	18.7		8.3
Green Ext Time (p_c), s	0.1	8.6		1.0	0.0	8.4		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	15.7
HCM 2010 LOS	B

Notes

Intersection Collision Rate Calculations

Hood Mountain Expansion TIS

Intersection # 1: SR 12 & Los Alamos

Date of Count: Tuesday, August 02, 2016

Number of Collisions: 12
Number of Injuries: 9
Number of Fatalities: 0
ADT: 22600
Start Date: January 1, 2012
End Date: December 31, 2016
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Signals
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{ADT} \times 365 \text{ Days per Year} \times \text{Number of Years}}$$

$$\text{collision rate} = \frac{12 \times 1{,}000{,}000}{22{,}600 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.29 c/mve**	**0.0%**	**75.0%**
Statewide Average*	**0.27 c/mve**	**0.4%**	**41.9%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2013 Collision Data on California State Highways, Caltrans

Intersection # 2: SR 12 & Pythian Road

Date of Count: Thursday, March 30, 2017

Number of Collisions: 8
Number of Injuries: 3
Number of Fatalities: 0
ADT: 17200
Start Date: January 1, 2012
End Date: December 31, 2016
Number of Years: 5

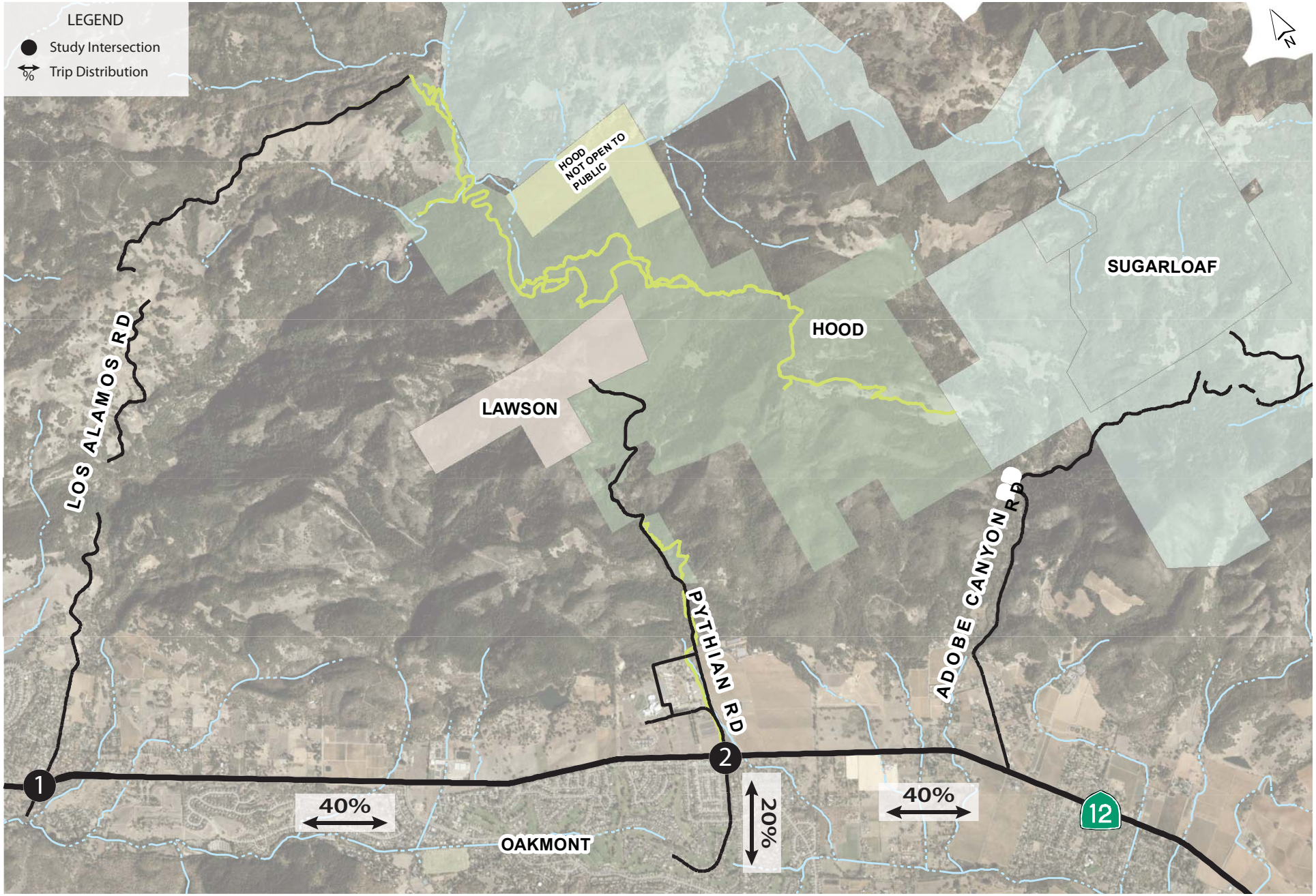
Intersection Type: Four-Legged
Control Type: Signals
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{ADT} \times 365 \text{ Days per Year} \times \text{Number of Years}}$$

$$\text{collision rate} = \frac{8 \times 1{,}000{,}000}{17{,}200 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.25 c/mve**	**0.0%**	**37.5%**
Statewide Average*	**0.27 c/mve**	**0.4%**	**41.9%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2013 Collision Data on California State Highways, Caltrans



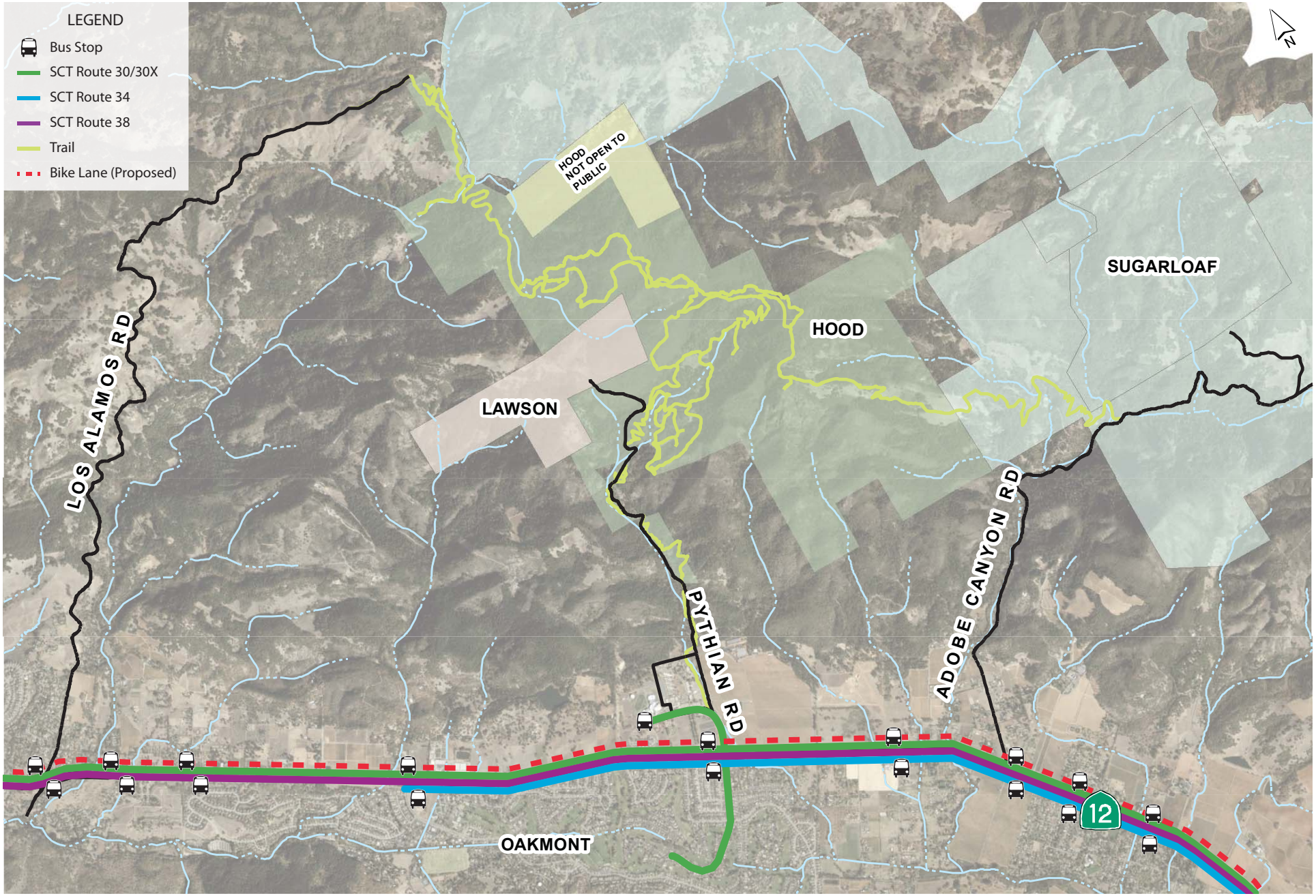
Map Base Source: Sonoma County Regional Parks 3/17

sox920-3.ai 6/17

Focused Traffic Study for Hood Mountain Lawson Expansion

Enclosure 3 – Trip Distribution

W-Trans



Map Base Source: Sonoma County Regional Parks 3/17

sox920-3.ai 6/17

Focused Traffic Study for Hood Mountain Lawson Expansion

Enclosure 4 – Alternative Modes

APPENDIX C
MITIGATION MONITORING AND REPORTING PROGRAM

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MITIGATION MONITORING AND REPORTING PROGRAM

This Mitigation and Monitoring Reporting Program (MMRP) has been formulated based upon the findings of the Initial Study/Mitigated Negative Declaration (IS/MND) prepared for the proposed Hood Mountain Regional Park and Open Space Preserve – Lawson Expansion Master Plan (proposed project). The purpose of the MMRP is to ensure the implementation of mitigation measures identified as part of the environmental review for the project. The MMRP includes the following information:

- A list of mitigation measures;
- The party responsible for implementing the mitigation measure;
- The timing for implementation of the mitigation measure;
- The agency/city department responsible for monitoring the implementation; and
- The monitoring action and frequency.

If the IS/MND is adopted, and if the County approves the project, including the mitigation measures as conditions of approval, then Sonoma County Regional Parks (Regional Parks) must adopt this MMRP, or an equally effective program.

Table 1: Mitigation Monitoring and Reporting Program

Mitigation Measures	Implementation Actions	Monitoring/ Reporting Responsibility	Timing Requirements	Verification By/Date
I. AESTHETICS				
There are no significant impacts related to aesthetics.				
II. AGRICULTURAL RESOURCES				
There are no significant impacts related to agricultural resources.				
III. AIR QUALITY				
There are no significant impacts related to air quality.				
IV. BIOLOGICAL RESOURCES				
Mitigation Measure BIO-1: Prior to construction of any new trails, or other facilities, an assessment of potential specific effects on candidate, sensitive or special status species shall be performed in consultation with applicable resource agencies. If there are any potential impacts to special status species, appropriate authorizations from the U.S. Army Corps of Engineers, California Department of Fish and Wildlife and U.S. Fish and Wildlife Service shall be obtained. It is expected that any such impacts will be relatively minor, and any mitigation required by the agencies can be accomplished through enhancement of existing resources within the Lawson Expansion. Prior to construction of any trails or other facilities, mitigation measures, identified and approved by the regulatory agencies as sufficient to fully offset all identified impacts, shall be incorporated into the project and implemented by Regional Parks. Mitigation measures would include, but are not limited to, placement of exclusion fencing or flagging to avoid habitat areas, restoration and/or replacement of suitable habitat, construction monitoring, and potential relocation of individual species, if needed.	Include measure as Condition of Approval.	• SCRP is responsible for including measure as a Condition of Approval, hiring a qualified wetland specialist, obtaining necessary permits, and implementing required mitigation. • A qualified biologist is responsible for determining effects to special status species.	Prior to construction activities.	
Mitigation Measure BIO-2: Prior to construction of any new trails, or other facilities, a jurisdictional determination shall be performed, and if there are any impacts to jurisdictional waters, appropriate authorizations from the U.S. Army Corps of Engineers, California Department of Fish and Wildlife and Regional Water Quality Control Board shall be obtained. It is expected that any such impacts will be relatively minor, and any mitigation required by the agencies can be accomplished through enhancement of existing resources within the Lawson Expansion. Prior to construction of any trails or other facilities, mitigation measures, identified and approved by the regulatory agencies as sufficient to fully offset all identified	• Include measure as Condition of Approval. • Implementation actions are outlined in the mitigation measure.	• SCRP is responsible for including measure as a Condition of Approval, hiring a qualified wetland specialist, obtaining necessary permits, and implementing required mitigation. • A qualified wetland specialist is	Prior to construction activities.	

Mitigation Measures	Implementation Actions	Monitoring/ Reporting Responsibility	Timing Requirements	Verification By/Date
impacts, shall be incorporated into the project and implemented by Regional Parks. Fill of jurisdictional features will be mitigated at a minimum ratio of 1:1 (no net loss) through restoration or creation of wetland areas on the project site. A wetland mitigation plan shall be developed for any required mitigation. The plan shall include performance standards for the mitigation wetlands, which wil be monitored for at least 5 years. The results of the monitoring shall be reported in annual reports submitted to the responsible regulatory agencies.		responsible for preparing a jurisdictional delineation.		
Mitigation Measure BIO-3: Regional Parks shall prepare and submit an Erosion Control Plan to Sonoma County that shall include construction specifications for grading plans, project designs, and other relevant information. The Applicant shall comply with any measures outlined by the County of Sonoma, RWQCB, Corps, and California Department of Fish and Wildlife (CDFW) with regard to seasonal water and erosion control issues. The following measures to control erosion and sedimentation from the proposed project shall be implemented: • If determined to be necessary, sediment control measures may include inlet protection, straw bale barriers, straw mulching, straw wattles, and other recommendations from the County of Sonoma. • Disturbance within the project area shall be kept to a minimum. Immediately after vegetation has been removed, one or more barriers of silt fencing may be installed, if determined to be necessary, at the downslope end of the work area to prevent sediments and debris from washing into downstream water sources. This fencing would be maintained throughout construction, and sediment that settles against it would be removed, as necessary, in order to ensure the continued functioning of the silt fencing as a water filtration measure. If large rainfall events or heavy stream flow are anticipated during the construction period, the fencing may be temporarily removed. • The soil and rock fill shall be compacted to prevent	• Include measure as Condition of Approval. • Implementation actions are outlined in the mitigation measure.	• SCRP is responsible for preparing and implementing the Erosion Control Plan prior to and during construction activities, and for periodic monitoring during construction to ensure sit fencing or other sediment control measures are functioning properly.	Prior to and during construction activities.	

Mitigation Measures	Implementation Actions	Monitoring/ Reporting Responsibility	Timing Requirements	Verification By/Date
erosion and washouts. • Periodic inspections shall be provided during construction to ensure that all measures are in place.				
Mitigation Measure BIO-4: If construction is proposed to occur during the nesting season (February 1 through August 31), a qualified biologist shall conduct nesting bird surveys prior to tree pruning, tree removal, ground disturbing activities, or construction activities to locate active nests on or immediately adjacent to the project site. • Preconstruction surveys shall be conducted no more than 14 days prior to initiation of construction activities or tree trimming/removal. If the project is delayed, additional preconstruction surveys at 14-day intervals shall be completed until project construction is initiated on the site. • Locations of active nests shall be described and protective measures implemented. Protective measures shall include establishment of clearly delineated (i.e., orange construction fencing) exclusion zones around each nest sites. The exclusion zone shall have a radius of 50 to 250 feet centered on the nest tree. The size of the exclusion zone shall be determined by a qualified biologist and shall take into consideration the bird species and the level of disturbance anticipated near the nest. Typically, exclusion zones for passerines are 50 feet, while those for raptors may be up to 250 feet. • Active nest sites shall be monitored periodically throughout the nesting season to identify any sign of disturbance. These protection measures shall remain in effect until the young have left the nest and are foraging independently or the nest is no longer active. • Exclusion zones may be reduced in size, if in the opinion of the project biologist and in consultation with the California Department of Fish and Wildlife, a smaller exclusion zone is determined to adequately protect the active nest. Additional monitoring (i.e., daily) may be required to monitor the behavior of the nesting birds if the exclusion zones are reduced in size. The project biologist	• Include measure as Condition of Approval. • Implementation actions are outlined in the mitigation measure.	• SCRP is responsible for incorporating measure into contract specifications, and for ensuring compliance during construction. • A qualified biologist is responsible for conducting preconstruction surveys, establishing nest buffers/exclusion zones, and for monitoring of exclusion zones during construction.	Prior to and during construction activities.	

Mitigation Measures	Implementation Actions	Monitoring/ Reporting Responsibility	Timing Requirements	Verification By/Date
shall be responsible for determining if the smaller exclusion zones are effective. • The project biologist shall prepare a report at the end of the construction season detailing the results of the preconstruction surveys and monitoring. The report shall be submitted to Regional Parks by November 30 of each year.				
V. CULTURAL RESOURCES				
Mitigation Measure CULT-1: During construction activities, a qualified archaeologist shall be consulted if additional unknown historical or archaeological resources are discovered during improvements or routine maintenance within the Lawson Expansion. The archaeologist shall evaluate the find pursuant to the CEQA guidelines and make recommendations for its treatment.	• Include measure as Condition of Approval. • Implementation actions are outlined in the mitigation measure.	• SCRP is responsible for incorporating measure into contract specifications, for ensuring compliance during construction, and hiring a professional archaeologist (if discoveries are made). • A professional archaeologist is responsible for evaluating any resources found inadvertently during construction; and identifying appropriate mitigation measures. • The Project Contractor is responsible for coordinating and cooperating with the archaeologist and any stop-work orders if resources are	During construction activities.	

Mitigation Measures	Implementation Actions	Monitoring/ Reporting Responsibility	Timing Requirements	Verification By/Date
		discovered.		
Mitigation Measure CULT-2: Should sensitive areas that are currently obscured by vegetation be cleared, a cultural resources survey shall be performed immediately after, or as close to that time as possible, when ground visibility would be at its highest.	• Include measure as Condition of Approval. • Implementation actions are outlined in the mitigation measure.	• SCRP is responsible for incorporating measure into contract specifications, for ensuring compliance during construction, and hiring a professional archaeologist (if discoveries are made). • A professional archaeologist is responsible for evaluating any resources found inadvertently during construction; and identifying appropriate mitigation measures. • The Project Contractor is responsible for coordinating and cooperating with the archaeologist and any stop-work orders if resources are discovered.	During construction activities.	
Mitigation Measure CULT-3: Should paleontological resources be encountered during project subsurface construction activities, all ground-disturbing activities within 25 feet shall be redirected and a qualified paleontologist contacted to assess the situation, consult with Regional Parks' representatives, and make recommendations for the	• Include measure as Condition of Approval. • Implementation actions are outlined in the mitigation	• SCRP is responsible for incorporating measure into contract specifications, hiring a qualified	During construction activities.	

Mitigation Measures	Implementation Actions	Monitoring/ Reporting Responsibility	Timing Requirements	Verification By/Date
treatment of the discovery. If the find is determined to be significant, and project activities cannot avoid impacting the resource, the impact to the resource shall be mitigated in accordance with the recommendations of the consulting paleontologist. Mitigation may include monitoring, recording the fossil locality, data recovery and analysis, a final report, and accessioning the fossil material and technical report to a paleontological repository. Public educational outreach may also be appropriate. Upon completion of the assessment, a report documenting methods, findings, and recommendations of the investigation shall be prepared and submitted to the Regional Parks, and, if paleontological materials are recovered, a paleontological repository, such as the University of California Museum of Paleontology	measure.	paleontologist (if discoveries are made), and for ensuring compliance during construction. • A qualified paleontologist is responsible for evaluating any resources found inadvertently during construction; and identifying appropriate mitigation measures. • The Project Contractor is responsible for coordinating and cooperating with the paleontologist and any stop-work orders if resources are discovered.		
Mitigation Measure CULT-4: If human remains are encountered during project construction, work within 25 feet of the discovery shall be redirected and the Sonoma County Coroner notified immediately. At the same time, the archaeologist who served as monitor or consulting archaeologist shall be contacted to assess the situation, in consultation with the descendant community also involved with the pre-construction testing, as well as the Coroner's representative. Project personnel shall not collect or move any human remains and associated materials. If the human remains are of Native American origin, the Coroner shall notify the Native American Heritage Commission within 24 hours of this identification. The Native American Heritage Commission will identify a Most Likely Descendant (MLD), which will likely be the representative of the descendant	• Include measure as Condition of Approval. • Implementation actions are outlined in the mitigation measure.	• SCRP is responsible for incorporating measure into contract specifications, hiring a professional archaeologist (if discoveries are made), and for ensuring compliance during construction. • A professional archaeologist is responsible for	During construction activities.	

Mitigation Measures	Implementation Actions	Monitoring/ Reporting Responsibility	Timing Requirements	Verification By/Date
community already involved, to inspect the site and provide recommendations for the proper treatment of the remains and associated grave goods. Upon completion of the assessment, the archaeologist shall prepare a report documenting the investigation's methods and results, and provide recommendations for the treatment of the human remains and any associated cultural materials, as appropriate and in coordination with the recommendations of the MLD. The draft report shall be submitted to Regional Parks, the descendant community involved in the treatment of the resources, and the Northwest Information Center, as required by law.		assessing the situation, and for preparing the report. • The Project Contractor is responsible for coordinating and cooperating with the County Coroner and professional archaeologist and for any stop-work orders if human remains are discovered.		
VI. GEOLOGY AND SOILS				
Mitigation Measure GEO-1: Prior to grading, excavation, and construction of the proposed overnight cabin or modifications to the existing water tank under the MP/RMP, a design-level geotechnical report shall be prepared by a licensed professional and submitted to Sonoma County Parks staff for review and approval. The geotechnical review shall specifically address potential adverse geological conditions at the site, including but not limited to expansive soils and seismic shaking and verify that the project plans incorporate the current California Building Code requirements, and other applicable design standards. All design measures, recommendations, design criteria, and specifications set forth in the design-level geotechnical review shall be implemented as a condition of project approval.	• Include measure as Condition of Approval. • Implementation actions are outlined in the mitigation measure.	SCRP is responsible for incorporating measure into contract specifications, for hiring a license professional to prepare the geotechnical report, and for ensuring design measures, recommendations, design criteria and specifications are incorporated into project plans.	Prior to construction activities.	
Mitigation Measure GEO-2: Regional Parks shall implement the following best management practices (BMPs) in designing and constructing minor improvements such as trails and campsites: • Ground-disturbing work shall be scheduled during the dry season, to the extent feasible, when associated erosion can be reduced the maximum to minimize the potential for slope failure. • Location of landslides shall be confirmed prior to trail	• Include measure as Condition of Approval. • Implementation actions are outlined in the mitigation measure.	SCRP is responsible for implementing BMPs in the construction of minor improvements such as trails and campsites.	During construction activities.	

Mitigation Measures	Implementation Actions	Monitoring/ Reporting Responsibility	Timing Requirements	Verification By/Date
construction. Trails shall be routed to avoid cuts across steep slopes and any areas of active landslides. • Trails shall be routed, where feasible, above trees and large outcroppings to avoid roots and to utilize the structural support they provide. If appropriate, root systems shall be left in place during vegetation management activities.				
VII. GREENHOUSE GAS EMISSIONS				
There are no significant impacts related to greenhouse gas emissions.				
VIII. HAZARDS				
Mitigation Measure HAZ-1: Regional Parks shall avoid the use of pesticides and herbicides through the use of alternative measures such as manual or chemical removal, planting with competitive native species, or otherwise altering habitat conditions to suppress invasive, exotic species (e.g., limiting ground disturbance). If non-chemical approaches provide unsuccessful, herbicides or pesticides shall be used on a case-by-case basis. If herbicides or pesticides are used, Regional Parks shall: • Use herbicides only to spot treat high-priority infestations. • Conduct herbicide application under the guidance of a licensed Pest Control Advisor and Natural Resources Manager • Ensure that any use of pesticides or herbicides is conducted according to manufacturer recommendations. • Employ BMPs for staging, maintenance, fueling, and spill containment of potentially hazardous materials used on the property. • Use pesticides and herbicides with caution to prevent contaminated runoff, particularly for road maintenance and vegetation management activities conducted by staff or other groups.	• Include measure as Condition of Approval. • Implementation actions are outlined in the mitigation measure. • Incorporate measure as part of construction specifications.	• SCRP is responsible implementing these measures to minimize impacts associated with the use of pesticides and herbicides.	During vegetation removal activities.	
Mitigation Measure HAZ-2: The following measures shall be implemented throughout the construction period to reduce the potential risk associated with fire hazards:	• Include measure as Condition of Approval.	• SCRP is responsible for implementing these measures to reduce the potential	During construction activities.	

Mitigation Measures	Implementation Actions	Monitoring/ Reporting Responsibility	Timing Requirements	Verification By/Date
• Regional Parks' staff shall comply with County fire prevention practices. • Upon notification from the County Fire Department that a "Red Flag Warning – High Fire Danger Alert" exists for the County, Regional Parks shall suspend any construction activities involving powered mechanical equipment and shall limit motorized vehicle access to construction staging areas. • Regional Parks' staff shall hold fire prevention training session(s) for construction staff, contractors, and volunteers. The training shall describe the County's fire prevention procedures and regulations for smoking and open fires on park lands, including; - The prohibitions on smoking and open fire or flames while on Regional Parks' land; - The use of fire suppression equipment; and - The use of avoidance measures such as not allowing heated tools to contact with ignitable fuels or not driving off road or in any area with tall grass. • Regional Parks shall maintain fire suppression equipment, including water pumpers and fire extinguishers on site and on trucks and tractors. • Regional Parks shall maintain communication equipment, including cell phones and radios on site during construction to allow for rapid contact of emergency responders. • Regional Parks shall implement the following measures to reduce risk of fire resulting from the use and storage of fuel: - Refuel power equipment or tools in a cleared space; - Store fuel in a cleared space and, where possible, in the shade; - Turn off equipment while fueling;	• Implementation actions are outlined in the mitigation measure.	risk associated with fire hazards during construction of proposed improvements.		

Mitigation Measures	Implementation Actions	Monitoring/ Reporting Responsibility	Timing Requirements	Verification By/Date
- Use a gas spout/funnel to avoid spills; and - Remove or dry any spilled fuel prior to starting equipment				
IX. HYDROLOGY AND WATER QUALITY				
There are no significant impacts related to hydrology and water quality.				
X. LAND USE AND PLANNING				
There are no significant impacts related to land use and planning.				
XI. MINERAL RESOURCES				
There are no significant impacts related to mineral resources.				
XII. NOISE				
XIII. POPULATION AND HOUSING				
There are no significant impacts related to population and housing.				
XIV. PUBLIC SERVICES				
There are no significant impacts related to public services.				
XV. RECREATION				
There are no significant impacts related to recreation.				
XVI. TRANSPORATION/TRAFFIC				
There are no significant impacts related to transportation/traffic.				
XVII. UTILITIES AND SERVICE SYSTEMS				
There are no significant impacts related to utilities and service systems.				

APPENDIX D
RESPONSE TO COMMENTS

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LSA

BERKELEY
CARLSBAD
FRESNO
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: May 14, 2018

TO: Karen Davis-Brown, Park Planner II

FROM: Shanna Guiler, AICP, Associate

SUBJECT: Hood Mountain Regional Park and Open Space Preserve – Lawson Expansion Master Plan Initial Study/ Mitigated Negative Declaration – Response to Comments

In accordance with CEQA Guidelines Section 15073, the Public Review Draft Initial Study/Mitigated Negative Declaration (IS/MND) was circulated for public review for 30 days beginning on September 11, 2017 and ending on October 10, 2017. The Public Review Draft IS/MND was posted on the project website http://parks.sonomacounty.ca.gov/, and made available at the following locations:

- **Sonoma County Regional Parks Department**, 300 County Center Drive, Suite 120A, Santa Rosa, CA 95403
- **Northwest Regional Library**, 150 Coddingtown Center, Santa Rosa, CA 95403
- **Santa Rosa Library**, 11 E Street, Santa Rosa, CA 95404
- **Sonoma Valley Regional Library**, 755 West Napa Street, Sonoma, CA 95476

Four comment letters were received by the Sonoma County Regional Parks Department during this comment and review period. Persons or agencies that provided written comments included the following:

- Kathy Branscomb, Local Property Owner;
- Nick Nesbitt, Redwood Empire Mountain Bike Alliance;
- Scott Morgan, State Clearinghouse; and
- Buffy McQuillen, Federated Indians of Graton Rancheria

Copies of these comment letters are provided in this memorandum and responses to the substantive issues raised by the commenters are provided on the page following the letters. When cross-referenced in the text, the comment is referred to as Letter-# where the letter refers to the commenter, and the number following the hyphen refers to the comment number within that

157 Park Place, Pt. Richmond, California 94801 510.236.6810 www.lsa.net

letter. For example, comment B-1 refers to the first comment within the letter submitted by Redwood Empire Mountain Bike Alliance (REMBA).

A

From: Kathy Branscomb
To: Karen Davis-Brown
Subject: public comment on Hood Mountain-Lawson Expansion master plan
Date: Thursday, September 21, 2017 1:13:52 PM

Good afternoon Ms. Davis-Brown:

My husband and I are owners of the property located at 4101 Pythian Road that borders Hood Mountain County Park. The Lawson family used to be our neighbors before they sold.

1 We are very concerned about the camping aspects of this proposed expansion due to the fire risk. Our property is up hill from the Lawson property. While I am sure you will post signs warning of no campfires, people will light them.....camping and camp fires go together, especially on the cooler evenings. Out-of-state or international visitors certainly will not understand the extreme fire danger inherit in California, even if they do read the signs. For example, I have stopped numerous hikers with lit cigarettes, even though there is a posted sign. If you are going to allow overnights, a ranger should be stationed at the campsites too. You have to understand that we are very vulnerable and rescue would not be assured, given
2 our remote location. We also have concerns about whether the campsites become a magnet for vagrants to hide out. We recently had a similar incident.

3 As part of the same issue, I have been trying to get someone from CalFire or Kenwood Fire Department to clear the fire break just above the Lawson property. This was a fire break that was established years ago when Willard Johnson owed a large parcel on the mountain. It has not been maintained. It is a safety concern, not only for us, but for all the Park visitors. I cannot get anyone to respond or acknowledge. I wonder if you can help?

Thanks,
Kathy Branscomb
415-515-7238

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Responses to Letter A
Kathy Branscomb, Local Property Owner

A-1: Camping currently exists within the Hood Mountain Regional Park and Open Space Preserve. Similar to the existing campsites at the Hood Mountain Regional Park, campfires would be prohibited with cooking by backpacking stoves only. No smoking or kerosene lamps are allowed and camping can be canceled during red flag days when the fire danger is high. The camping rules and regulations are currently posted on the Sonoma County Regional Parks website and would be posted on interpretive signage near the proposed campsites. As described below, campers are required to obtain permits and sign liability waivers and acknowledgements that they have reviewed park rules and regulations. Campers are required to stay in the developed area past dusk, unless they are participating in an official program (e.g., star gazing). In addition, campers would be supervised by on-site park staff, including law enforcement rangers. Therefore, it is anticipated that the camping program would continue to be successful on the Lawson Property.

A-2: Camping currently exists within the Hood Mountain Regional Park and Open Space Preserve. Similar to the existing Hood Mountain Regional Park camping, only registered campers with appropriate permits would be allowed to camp at the four additional environmental campsites on the Lawson property. Permits have name, address, payment and license plate information and campers are required to sign liability waivers and acknowledge that they have reviewed all camp rules and regulations. Guests under 18 years old must be accompanied by an adult. Proposed campsites would be primitive, hike-in sites that must be reserved in advance. In addition, camping requires a fee payment minimizing the risk of unruly users at the Lawson property.

A-3: The commenter's concerns related to the existing fire break are acknowledged. The MP/RMP includes monitoring of the site for illegal activity (e.g., smoking, campfires, firearms) that might cause wildfires, as well as maintaining fuel breaks to facilitate fire suppression. The following objective has been added to the MP/RMP to further reduce the risk of fire on the Lawson property:

MAINT-1.5 Establish and maintain shaded fuel breaks and implement and maintain fuel load reduction plan.

In addition, as specified in the IS/MND, the County would implement Mitigation Measure HAZ-2, which specifies best management practices to reduce the risk associated with fire hazards during the construction of proposed improvements identified in the MP/RMP.

REDWOOD EMPIRE MOUNTAIN BIKE ALLIANCE

B

For People Who Ride Mountain Bicycles in the Redwood Empire

PO Box 1123
Santa Rosa, CA
95402

Chairman
Nick Nesbitt

Treasurer
Todd Lindemann

Secretary
Jake Bayless

Board Members
Deb Bloomquist
Andrew Brooks
Jeff Cramer
Chris Culver
Doug McKenzie
Ken Wells

September 14, 2017

Bert Whitaker, Director
Sonoma County Regional Parks

RE: Hood Mountain Lawson Expansion Draft Master Plan Feedback

Mr. Whitaker,

As Chairman of REMBA, I'd like to express our enthusiastic support of the Hood Mountain Lawson Expansion Draft Master Plan (DMP), with one significant suggested revision.

1 It has come to our attention that several segments of trail in the Lawson Addition are denoted as "hiking only". We strongly believe that this is counter to the wishes of the community that feels all trails should be multi-use. We ask that you and your staff change the designations of all the proposed trails in the DMP to reflect this "multi-use" designation.

At REMBA we firmly believe that good multi-use trail design keeps all the users safe. We understand that having an opportunity to be polite *with other users* goes a long way towards building friends and partners in the great outdoors.

We also recognize that by not having "single use" trails, we can all work together to build allegiances to support and maintain our parks and open spaces. As we've seen in other communities, single-use trails breed discontent and pit users against one-another, rather than pulling them together to solve trail issues collegially.

Thank you for the opportunity to give you our enthusiastic feedback for the September 2017 Hood/Lawson Expansion Master Plan.

Nick Nesbitt
Chairman and cofounder, REMBA

Cc: Steve Ehret, Karen Davis-Brown

Responses to Letter B
Redwood Empire Mountain Bike Alliance
Nick Nesbitt, Chairman and cofounder

B-1: Out of the total 4.2 acres of trails proposed on the Lawson Property, only 1.31 acres of trail would be single-use, hiker-only trails. The remaining 2.8 miles would be multi-use trails. The following four trails are proposed to be hiker-only trails: (1) Lawson Peak Trail, (2) Lawson Camp Loop Trail, (3) Wild Lilac Hiker-Only Trail; and (4) Spire Point Trail. The Lawson Peak and Spire Point Trails are proposed to be hiker-only trails to reduce conflicts with users at the summit of Lawson Peak and Spire Point. The Lawson Camp Loop Trail is proposed to be a hiker-only trail to separate users from the gathering areas and prevent user conflicts within the campground sites. The Wild Lilac Hiker-Only Trail is proposed to be a hiker-only trail to preserve the native grassland within the acquired Sonoma County Agricultural Preservation and Open Space District property and easement. Overall, a majority of the proposed trails would be multi-use trails designed for concurrent use by hikers, equestrians, and bikers with only a small portion of trails (approximately one-fifth) proposed to be hiker-only trails.

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

C

Edmund G. Brown Jr.
Governor

Ken Alex
Director

October 11, 2017

Karen Davis-Brown
Sonoma County Regional Parks
2300 County Center Drive, Suite 120A
Santa Rosa, CA 95403

Subject: Hood Mountain Regional Park and Open Space Preserve - Lawson Expansion
SCH#: 2017092026

Dear Karen Davis-Brown:

1 The State Clearinghouse submitted the above named Mitigated Negative Declaration to selected state agencies for review. The review period closed on October 10, 2017, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Scott Morgan
Director, State Clearinghouse

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2017092026
Project Title Hood Mountain Regional Park and Open Space Preserve - Lawson Expansion
Lead Agency Sonoma County Regional Parks

Type **MND** Mitigated Negative Declaration

Description Sonoma County Regional Parks proposes to adopt and implement a proposed Master Plan/Resource Management Plan for the 247 acre Lawson Expansion that has recently been added to the Hood Mountain Regional Park and Open space preserve. The Lawson Expansion encompasses approx 247 acres of open space that include grasslands, oak woodlands, mixed evergreen forest and chaparral. The purpose of the MP/RMP is to guide the development of the Lawson Expansion and to identify the best way to manage and protect the site's resources while balancing the needs of the community for safe recreational and educational opportunities. Proposed improvements include trails, hike-in campsites, a two-room bunkhouse, backcountry horse facilities, and interpretive signs.

Lead Agency Contact

Name Karen Davis-Brown
Agency Sonoma County Regional Parks
Phone 707-565-1359 **Fax**
email
Address 2300 County Center Drive, Suite 120A
City Santa Rosa **State** CA **Zip** 95403

Project Location

County Sonoma
City Santa Rosa
Region
Lat / Long 38° 27' 06.9" N / 122° 34' 26.9" W
Cross Streets SR 12, Pythian Rd, Los Alamos Rd
Parcel No. 030-030-002, 030-110-007
Township **Range** **Section** **Base**

Proximity to:

Highways 12
Airports
Railways
Waterways Azalea Creek
Schools
Land Use RRD/RRD B6 100 and BH RC 50/50

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Cumulative Effects; Drainage/Absorption; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Growth Inducing; Landuse; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Septic System; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian

Reviewing Agencies Resources Agency; Department of Conservation; Department of Fish and Wildlife, Region 3; Cal Fire; Department of Parks and Recreation; Department of Water Resources; California Highway Patrol; Caltrans, District 4; Air Resources Board, Transportation Projects; State Water Resources Control Board, Division of Drinking Water; Regional Water Quality Control Board, Region 2; Department of Toxic Substances Control; Native American Heritage Commission

Date Received 09/11/2017 **Start of Review** 09/11/2017 **End of Review** 10/10/2017

Note: Blanks in data fields result from insufficient information provided by lead agency.

Responses to Letter C
State Clearinghouse
Scott Morgan, Director

C-1: This comment acknowledges the State Clearinghouse's receipt of the Mitigated Negative Declaration for the proposed project. The comment does not address the adequacy of the CEQA document or suggest changes to the document itself. No further response is necessary.

D

From: THPO@gratonrancheria.com
To: Karen Davis-Brown
Subject: Hood Mountain Park and Preserve-Lawson Expansion Master Plan
Date: Wednesday, September 27, 2017 3:11:09 PM

Dear Karen Davis-Brown,

1 Thank you for notifying the Federated Indians of Graton Rancheria about Hood Mountain Park and Preserve-Lawson Expansion Master Plan, a project within the Tribe's Ancestral Territory. We appreciate being notified and will review your project within 10 business days. If you have an immediate request please contact the Tribal Heritage Preservation Office for assistance by phone at (707) 566-2288 or by email at thpo@gratonrancheria.com.

Sincerely,

Buffy McQuillen
Tribal Heritage Preservation Officer (THPO)
Native American Graves Protection and Repatriation Act (NAGPRA)
Office: 707.566.2288; ext. 137
Cell: 707.318.0485
FAX: 707.566.2291

Antonette Tomic
THPO Administrative Assistant
Federated Indians of Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928
Office: 707.566.2288, ext. 143
Fax: 707.566.2291
atomic@gratonrancheria.com

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Federated Indians of Graton Rancheria and Tribal TANF of Sonoma & Marin - Proprietary and Confidential
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Responses to Letter D
Federated Indians of Graton Rancheria
Buffy McQuillen, Tribal Heritage Preservation Officer

D-1: This comment acknowledges the Federated Indians of Graton Rancheria's notification regarding the proposed project. The comment does not address the adequacy of the CEQA document or suggest changes to the document itself. No further response is necessary.