

Hawthorns Area of Windy Hill Open Space Preserve Transportation Study

Prepared for
Midpeninsula Regional Open Space District



June 2024

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Prepared for

Midpeninsula Regional Open Space District
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Executive Summary

This report presents the findings and recommendations of a transportation study for the Hawthorns Area, a 79-acre open space property in the Town of Portola Valley. The study was conducted by Parametrix and Mead & Hunt for Midpeninsula Regional Open Space District (Midpen), which is preparing a long-term use and management plan for the Hawthorns Area. The plan will include specific actions to open the Hawthorns Area to the public for recreation and education purposes.

The study evaluated the existing and future transportation conditions in the vicinity of the Hawthorns Area within the purview of this project, including the roadways and trails that provide access to the site, the traffic and parking demand generated by the proposed public access, and the potential impacts and mitigation measures for the transportation network. The study also considered the Town of Portola Valley's policies and goals for traffic safety, rural character preservation, and sustainable transportation. The main findings and recommendations of the study are:

- The Hawthorns Area is bounded by residential collector and local streets that serve the Town of Portola Valley and connect to regional routes. The Town has commissioned several studies to address the issues of existing traffic volumes, traffic safety, rural character, parking demand, and future development in the area.
- The existing traffic volumes on the surrounding roadways are moderate, with peak hours corresponding to the morning and evening commute periods. The roads are also popular for recreational bicycling, especially during the summer months. The collision rate on Alpine Road, which is the recommended site access for the Hawthorns Area, is slightly higher than the statewide average for similar facilities and includes four bicyclist-involved collisions in the past six years. The collision rate on Alpine Road is lower than on Los Trancos Road, the other road providing access to the Hawthorns Area.
- The parking demand at Midpen preserves is highest on weekends from the morning through early afternoon. The Windy Hill Open Space Preserve, which is adjacent to the Hawthorns Area, experiences high parking demand that often exceeds the available supply at the designated parking lots. Visitor parking on the roadway shoulders on weekends is an ongoing management concern for Midpen and the Town.
- The estimated parking demand for the Hawthorns Area is between 25 and 68 spaces, depending on the level of public access and the type of recreational activities offered. The study recommends providing 15 bicycle parking spaces to encourage alternative modes of transportation and reduce vehicle trips.
- The study recommends using Alpine Road as the primary site access for the Hawthorns Area, as it provides adequate sight distance to oncoming vehicle and bicycle traffic and has sufficient roadway width to accommodate a driveway entrance. The study also recommends implementing traffic calming measures, such as signage, striping, and speed feedback devices, to enhance the safety and awareness of drivers and bicyclists on Alpine Road.
- The study recommends coordinating with the Town of Portola Valley and other stakeholders to ensure the compatibility of the proposed public access plan with the Town's transportation goals and policies, and to address any potential impacts or concerns that may arise from the increased traffic and parking demand in the area.

The transportation study provides a comprehensive analysis of the transportation issues and opportunities for the Hawthorns Area and supports Midpen's efforts to develop a long-term use and management plan that will benefit the public and the environment.

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1. Project Description

The 79-acre Hawthorns Area is in the Town of Portola Valley (Town) in San Mateo County (Figure 1). The Hawthorns Area is near two Midpeninsula Regional Open Space District (Midpen) preserves: Windy Hill Open Space Preserve (Windy Hill), which is approximately one mile away via Alpine Road, and Thornewood Open Space Preserve (Thornewood), which is approximately three miles away via Portola Road.

Midpen is preparing a long-term use and management plan for the Hawthorns Area with recommendations to steward the site's natural, cultural, and historic resources and introduce ecologically sensitive public access. The plan will include specific actions to open the Hawthorns Area to the public, including general specifications for an access driveway, parking area, and other public amenities. Access to the Hawthorns Area for land management purposes is currently provided by one driveway originating at Alpine Road and two driveways off Los Trancos Road.

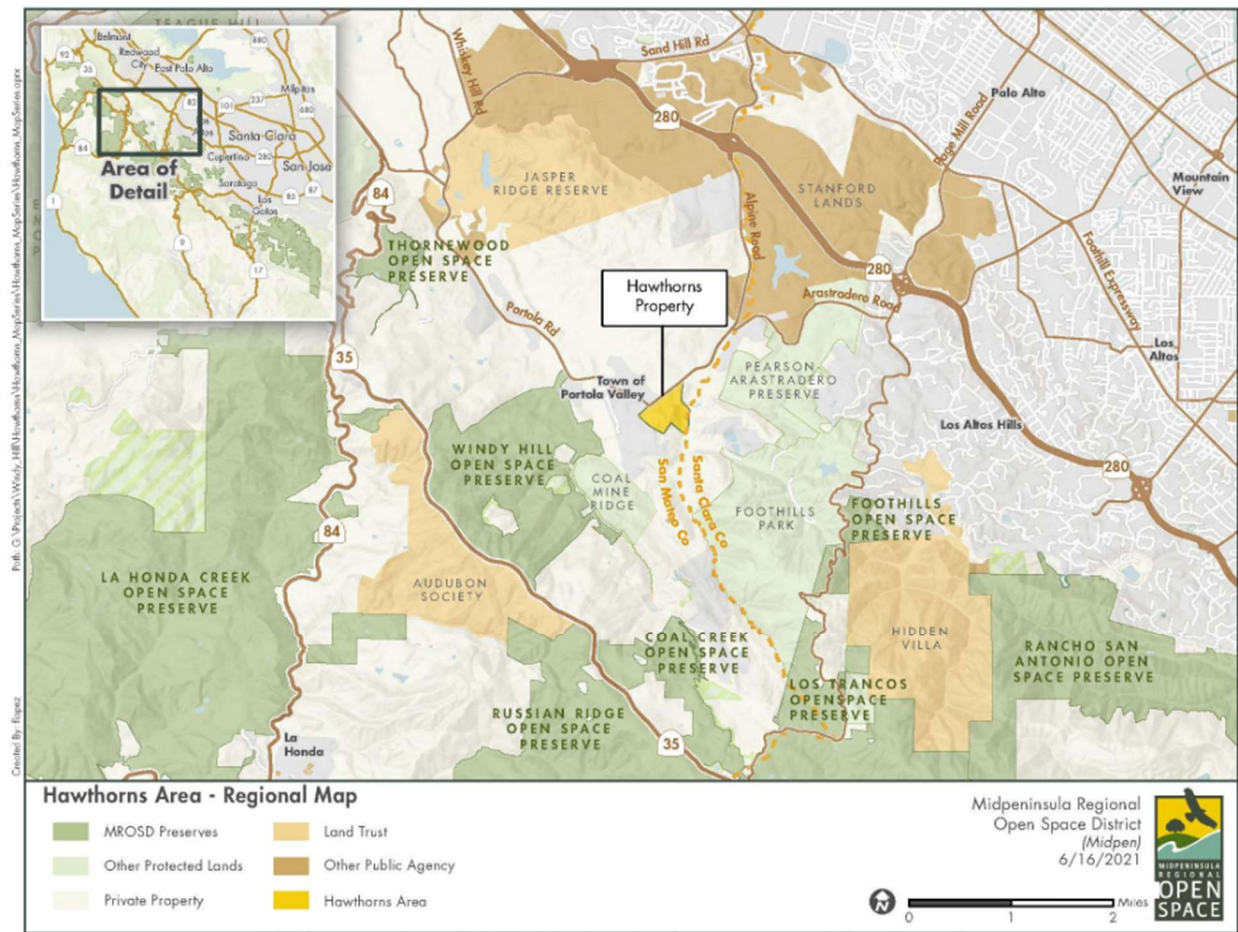


Figure 1 Town of Portola Valley Project Vicinity Map
Source: Midpen, 2021.

2. Study Area Description and Policies

This section provides a description of the surrounding roadways, trails, and public transit service and a summary of relevant local and regional plans and policies.

2.1 Roadway, Trail, and Transit Network

2.1.1 Roadway

Where it bounds the Hawthorns Area, **Alpine Road** is a two-lane minor arterial roadway with a posted speed limit of 35 miles per hour. The roadway ranges between 35 and 60 feet wide between the edges of the roadway shoulder.

Along the boundary of the Hawthorns Area, **Los Trancos Road** is a two-lane local road with a posted speed limit of 35 miles per hour. The roadway ranges between 20 and 36 feet wide between the edges of the roadway shoulder.

2.1.2 Trail

The Town's public trail network runs along the perimeter of the Hawthorns Area (Figure 2). The Sweet Springs, Firethorne, and Los Trancos Trails are designated for pedestrians, equestrians, and dogs on leash. Similarly, the Alpine Trail permits pedestrians, equestrians and dogs on leash along most of the Hawthorns boundary. However, there is a section of the Alpine Trail between Indian Crossing Road and Portola Road that also allows bicycles. Allowed uses are outlined on the trail map, which are sourced from the Town of Portola Valley trail map and City of Palo Alto preserve maps.

Within the on-street circulation network, there are marked crosswalks at the Alpine Road / Portola Road intersection. There are no continuous sidewalks in the study area apart from the trail network. The striped shoulders on Alpine Road and Portola Road function as on-street bike lanes, although there are no signs or markings indicating them as designated bikeways. Alpine Road and Portola Road are popular local bicycling routes.

2.1.3 Shuttle & Transit

As of August 6, 2023, SamTrans provides two school-oriented bus routes through the Town. Route 85 is a school-oriented route that provides limited PM weekday service from Ormondale School to La Honda/Grandview. The bus route serves Woodside and Portola Valley with stops including Portola Valley Town Hall and Skyline Boulevard and La Honda Road. The stop closest to the Hawthorns Area is located at Portola Road and Alpine Road.

Route 87 is a school-oriented route that provides limited PM weekday service from Woodside High to Portola Valley. The bus route serves Palo Alto, Portola Valley, Woodside, Atherton, and Menlo Park with stops including Portola Valley Town Hall. The stop closest to the Hawthorns Area is located at Portola Road and Alpine Road. These routes operate only during afterschool hours and would not serve as a multimodal travel option to the Hawthorns Area. Expanding transit services to serve the Hawthorns Area will require additional feasibility analysis and coordination among SamTrans, the Town of Portola Valley, and Midpen, that will also require development of an operations and funding plan. Future transit options may consider micro-transit and shuttle service, which would also require coordination and partnerships.

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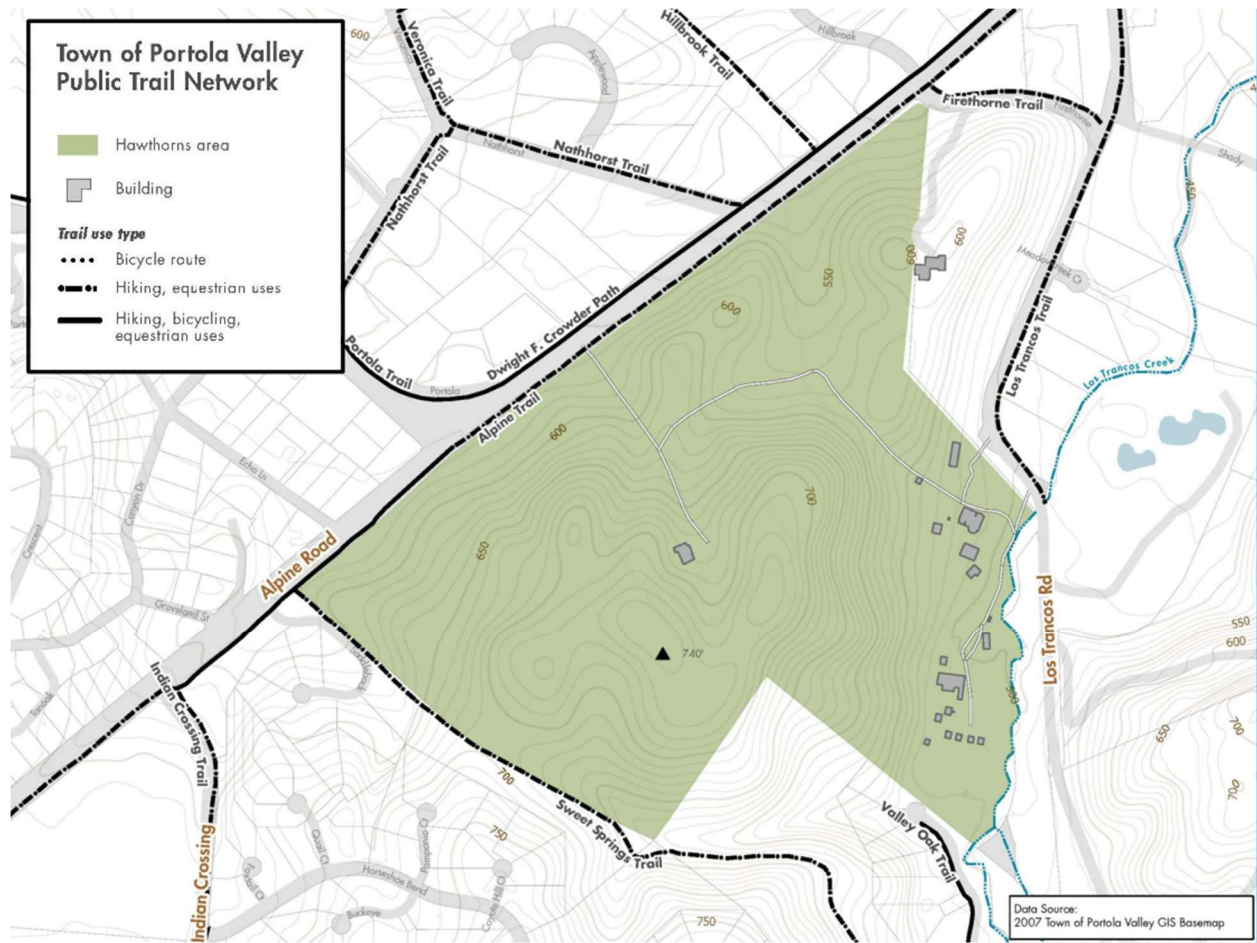


Figure 2 Town of Portola Valley Trail Map
Source: Town of Portola Valley, 2007.

2.2 Local Plans and Policies

The following section summarizes planning efforts undertaken prior or in parallel to the Hawthorns Area study and their potential relevance to the Project.

2.2.1 Midpen Plans and Projects

Rancho San Antonio Multimodal Access Project

Conducted from 2019 through 2020, the Rancho San Antonio Multimodal Access project explored and evaluated non-motorized mobility, transit options, and parking alternatives for Midpen's Rancho San Antonio Open Space Preserve in Santa Clara County. The project aimed to encourage visitors to use greener modes of transportation and reduce parking demand and traffic, while maintaining equitable access for both local and regional visitors. The resulting report identified 26 potential travel demand management (TDM) strategies that were scored and prioritized. The first priority TDM strategies are:

- Bike facilities

- New and improved bike access
- Subsidized ride-hail
- Free or low-cost shuttle service
- Carpool restricted lot
- Dynamic or variable signage

The study report also includes high-level next steps for the prioritized TDM strategies. Several first priority TDM strategies are currently being planned and implemented.

Purisima Creek Redwoods Multimodal Access Project

The Purisima Creek Redwoods Multimodal Access project was commissioned by Midpen in mid-2021 and completed in November 2022. The project's goals were to evaluate the existing parking, access and visitation; identify ways to address high visitor parking and traffic demand, including increasing non-drive modes; and develop an implementation plan for the preferred strategies. High priority travel demand management (TDM) strategies produced by the study include the following measures:

- Parking management: Parking reservations during peak periods. Priority parking for carpools or reserved parking.
- Parking capacity: Configure parking areas to delineate parking stalls to improve parking efficiency.
- Alternative modes: Bicycle parking at trailheads. Shuttles from satellite parking lots.
- Traveler information: Social media outreach to publicize TDM strategies. Real-time parking lot occupancy traveler information.

Applicability to the Hawthorns Area

Both the Rancho San Antonio and Purisima Creek Redwoods Multimodal Access studies provide a framework through which strategies for the Hawthorns Area can be viewed and evaluated. Rancho San Antonio is a well-visited preserve and is located in a more urban setting whereas Purisima Creek is situated in a more rural, coastal area in unincorporated San Mateo County. Certain TDM strategies (or iterations of the strategies) identified for these two preserves may be applicable to the Hawthorns Area based on level of use expected and likelihood of effectiveness.

2.2.2 Town of Portola Valley

The following section summarizes the plans, policies and committees that govern multimodal circulation in the Town of Portola Valley; this section also includes references to recent studies commissioned by the Town to address circulation and traffic safety issues.

General Plan

Multimodal circulation in the Town of Portola Valley is governed by the Town General Plan Circulation Element and Trails and Paths Element. Policies relevant to the Hawthorns Area include the Town's desire to emphasize the "country lane" quality of roads to the maximum extent possible while still meeting an acceptable level of safety (3106.1). Alpine Road is identified as a major arterial roadway that should be maintained as a two-lane road within Town Limits (3110) and also as one of two corridors that the Town should monitor for safety problems (Circulation Element Appendix 1).

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Town Bicycle, Pedestrian and Traffic Safety (BPTS) Committee

The Town has a Bicycle, Pedestrian and Traffic Safety (BPTS) Committee that meets monthly. Based on meeting agendas from 2022, the BPTS meetings typically discuss traffic collisions and citations as reported by the County Sheriff's department, project updates by Town Public Works staff, parking conditions at the Windy Hill Open Space Preserve, and public questions. This committee has also discussed the Town's interest in widening and/or realigning the existing Alpine Trail to accommodate better access along the Hawthorns property's frontage on Alpine Road. The Hawthorns Area Plan Public Access Working Group (PAWG) process includes evaluation of potentially widening the existing Alpine Trail. The BPTS has an assigned liaison to a Town Ad Hoc Committee specifically formed to assist with the Midpen Hawthorns Area Plan project.

Town Trail and Paths Committee

The Town has a Trail and Paths Committee that meets monthly. Based on meeting agendas from 2022, the committee meetings typically discuss maintenance needs on the Town's trail network. The committee has expressed ongoing interest in a trail through the Hawthorns area to connect to the Sweet Springs Trail. The Hawthorns Area Plan PAWG process includes evaluation of potential connections to Sweet Springs Trail. The Trails and Paths Committee has an assigned liaison to a Town Ad Hoc Committee specifically formed to assist with the Midpen Hawthorns Area Plan project.

BPTS 2019-2020 Safety Study

The Town commissioned a pedestrian safety study in 2019 to identify areas needing safety improvements.¹ The Town's consultant, Krupka Consulting, solicited input through interviews with community representatives, from outreach via social media, and at public meetings. The study identified a list of issues and opportunities near schools and on the Alpine Road and Portola Road corridors and developed a list of proposed improvements to address these issues. In the Hawthorns Area vicinity, the Safety Study observed and recommended the following:

A3 Alpine / Golden Oak (West)

Observation: Limited motorist and pedestrian visibility (sight distance) between two reversing curves and conflicts at local street and driveway intersections.

Recommendation: Crosswalk signs, markings, and rapid flashing beacons

A4 Alpine / Los Trancos

Observation: Conflicts between eastbound drivers making right turns, southbound drivers leaving the Portola Valley Garage, and pedestrians and bicyclists. Overgrown foliage from the northbound Los Trancos Road approach.

Recommendations: Advisory and warning signs and lane markings

A5 Alpine / Portola

Observations: Notable pedestrian volumes crossing Portola Road, drivers making "rolling stops" to turn right from Alpine onto Portola Road, and high A.M. commute vehicle traffic

¹ <https://www.portolavalley.net/government/town-committees/bicycle-pedestrian-traffic-safety-committee/bpts-2019-2020-safety-study>

demand at the southbound right turn onto Alpine Road. There is an adult crossing guard stationed here during school commute times.

Recommendations: Crosswalk signs and markings

The Town Council accepted the recommendations of the safety study in August 2019 and directed Town staff to develop improvements for funding in the Town's five-year Capital Improvements Program and apply for grant funding.

Traffic Improvement Projects 2021

Based on the 2019/2020 Safety Study, the Town installed crosswalk signs and pavement markings at nine (9) intersections in 2021, including three locations on Alpine Road, at Portola Road, Corte Madera Drive, and Westridge Drive.² According to BPTS Committee notes from April 2022, nine of the 14 locations are complete and the remaining five (5) locations are awaiting rapid flashing beacon installations.³

BPTS Portola Road & Willowbrook Drive Parking Study, December 2021.

The Town commissioned a study of parking restrictions at the Portola Road / Willowbrook Drive intersection in response to overflow parking by visitors to Windy Hill Open Space Preserve⁴. The study evaluated proposed parking restrictions that included no parking areas denoted by red curb paint and signs, signs advising drivers to avoid parking in the roadway shoulders or trails, and signs indicating allowable off-pavement parking areas.

The study found substantial weekend midday parking demand on Portola Road, Willowbrook Drive and Alpine Road attributed to Windy Hill visitors, with peak parking demand at 10 am. The sampled day yielded 30 to 60 parked cars on Portola Road north of Willowbrook Drive and 60 to 90 parked cars in the Willowbrook Drive/Alpine Road area south of the Willowbrook Drive divided road. The count day also showed 120 to 150 bicycles and 50 to 60 pedestrians per hour in both directions on Portola Road, and 10 to 20 bicycles and 20 to 30 pedestrians per hour in both directions on Willowbrook Drive. Both pedestrians and bicyclists tend to use the roadway shoulder, which can lead to intermodal conflicts with drivers making parking maneuvers.

According to the study, the recommendations from the study were either implemented by Town staff in November 2021 or are in the design process.

Portola Valley Wildfire Traffic Evaluation Capacity Study (October 2022)

The Town of Portola Valley commissioned a study in 2022 of the Town's evacuation system as part of its Safety Element Update. The study estimated the time needed to evacuate residents in the case of a wildfire, identified vulnerable areas, and developed strategies to improve emergency egress. Alpine Road is identified as a major evacuation route to I-280 for most residents and would experience the heaviest volumes during a major evacuation, particularly between Westridge Drive and I-280. Strategies identified in the study to manage high vehicle traffic demand on Alpine Road include evacuation traffic control by County Department of Emergency Management (DEM) staff, widening the paved shoulder between Westridge Drive and I-280 to function as a temporary second

² <https://www.portolavalley.net/departments/public-works/traffic-improvement-project>

³ <https://www.portolavalley.net/home/showpublisheddocument/16536/637974685171000000>

⁴ <https://www.portolavalley.net/home/showpublisheddocument/15940>

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outbound vehicle traffic lane, and using painted medians instead of raised medians to allow for temporary vehicle lanes during an evacuation.

Portola Valley Housing Element (May 2023)

The Constraints section highlights various factors impacting Portola Valley's zoning and infrastructure. The zoning ordinance mandates minimal landscaping requirements for residential parcels, particularly along Alpine Road and Portola Road. For these parcels, the approval of trees and shrubs within 75 feet of the road right-of-way falls under the jurisdiction of the Town's Conservation Committee. Moving to infrastructure and public service constraints, the Town's facilities are designed to accommodate a small, dispersed population. The roads exhibit narrow, winding characteristics with restricted capacity, and public transportation options are limited, primarily consisting of SamTrans bus service along Portola and Alpine roads (Bus routes 85 and 87).

Applicability to the Hawthorns Area

The Town's ongoing traffic and travel demand management will inform the access design for the Hawthorns Area and identify potential operational issues needing further management, specifically:

- Alpine Road as a major arterial subject to monitoring for safety problems (General Plan).
- Potential widening of the Alpine Trail (BPTS Committee).
- Trail connections from the Hawthorns site to other Town trails (Trail and Paths Committee)
- Parking and vehicle traffic management for traffic safety and emergency access (Portola Road & Willowbrook Drive Parking Study and Wildfire Traffic Evaluation Capacity Study).

2.2.3 Caltrans District 4 Bike Plan (2018)

The Caltrans District 4 Bike Plan identifies infrastructure improvements that can enhance bicycle safety and mobility throughout District 4 and remove some of the barriers to bicycling in the region. The Plan was developed in cooperation with local and regional partners to ensure that the improvements on the State Highway system complement proposals for local networks.

The plan identifies Highway 84 as a mid-tier project. Better bicycle connection to areas around Portola Valley could encourage bicycle access to the Hawthorns Area.

3. Existing Project Area Roadway Conditions

This section provides a summary of recent traffic counts and collisions collected on the roadways bounding or servicing the Hawthorns Area and the Town of Portola Valley.

3.1 Average Daily Traffic Counts, 2019 and 2023

The Town collected vehicle traffic counts across nine days in October 2019 as part of its regular traffic monitoring program (Figure 3). The data are summarized as average weekday and average weekend day counts in Table 1. Midpen commissioned Parametrix to collect new seven-day vehicle, pedestrian, and bicycle traffic counts at a subset of the Town’s count locations in late November and early December 2023 (Table 1). Midpen expanded the original two-day traffic count sample to seven days at the Town’s request. Midpen’s intent is to assess travel behavior changes over the past four years. There were two counts collected on Alpine Road where it bounds the north side of the Hawthorns Area (Location 2 and 3) and one count on Los Trancos Road south of the east property boundary (Location 6). The count at Alpine Road east of Westridge Road captures the traffic activity leading to and from Portola Valley from one of its gateway routes.

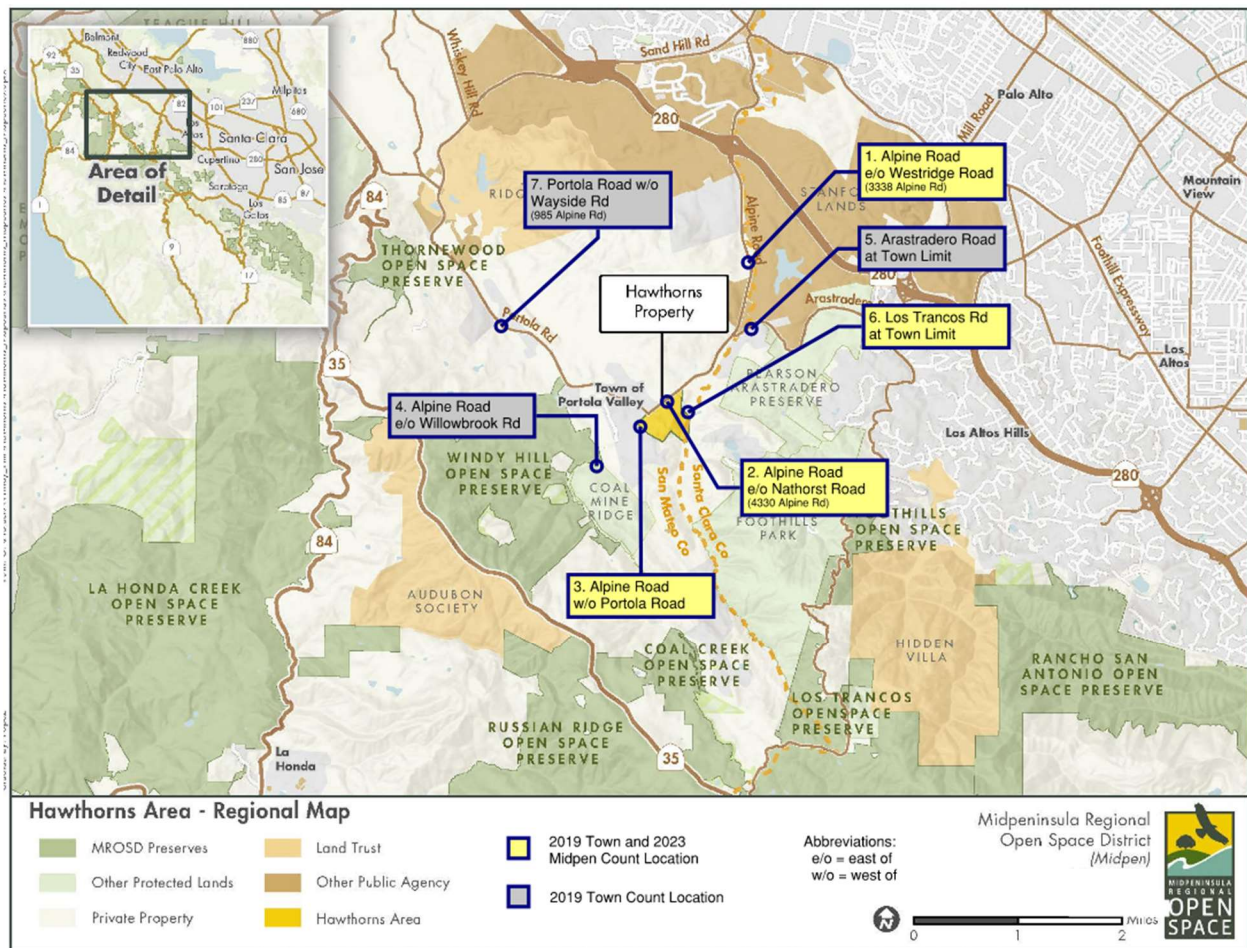


Figure 3 Town of Portola Valley Traffic Count Locations
 Source: Midpen and Parametrix, 2024.

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Table 1 Portola Valley 2019 and 2023 Vehicle Average Daily Traffic (ADT) Volumes

| # | Roadway Segment | Approx. Distance to Hawthorns Area | Roadway Classification ¹ | Weekday Average 2019 ² | Weekday Average 2023 ³ | Weekend Average 2019 ² | Weekend Average – 2023 ³ |
|---|--------------------------------------|------------------------------------|-------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------------|
| 1 | Alpine Road east of Westridge Road | 1.5 miles east | Minor Arterial | 12,100 | 11,500 | 9,300 | 8,300 |
| 2 | Alpine Road east of Nathorst Avenue | On the Project north boundary | Minor Arterial | 7,800 | 7,100 | 5,600 | 4,700 |
| 3 | Alpine Road west of Portola Road | On the Project north boundary | Major Collector | 3,300 | 2,900 | 2,500 | 1,900 |
| 4 | Alpine Road east of Willowbrook Road | 0.8 miles west | Major Collector | 300 | N/A ⁴ | 400 | N/A ⁴ |
| 5 | Arastradero Road at the Town Limit | 0.8 miles east | Local Road | 3,700 | N/A ⁴ | 2,900 | N/A ⁴ |
| 6 | Los Trancos Road near the Town Limit | 0.2 miles south | Local Road | 3,000 | 1,900 | 2,100 | 1,400 |
| 7 | Portola Road north of Wayside Road | 2.0 miles north | Minor Arterial | 6,000 | N/A ⁴ | 4,800 | N/A ⁴ |

1. California Department of Transportation (Caltrans) California Road System Functional Classification (2022).

2. Town of Portola Valley, 2019.

3. Parametrix, Nov. 29-Dec 5, 2023.

4. Counts not collected by Midpen in this location in 2023.

The average daily vehicle traffic counted in November and December 2023 tended to be lower than the counts collected in October 2019 by several hundred vehicles per day. One possible explanation for the decrease in vehicle traffic is that fewer people are commuting to work as a post-COVID-19 behavioral shift.

Recognizing that traffic counts collected during the winter season may reflect lower trip demand compared to warmer months and longer days, Parametrix consulted two online traffic data providers to assess travel demand during other months and prior years. Section 3.3 discusses the annual and seasonal travel data and estimated travel adjustment factors taken from these two data providers.

3.2 Multimodal Traffic Counts, November & December 2023

Traffic counts collected between November 29 and December 5, 2023 included counts of people walking and bicycling in addition to vehicle traffic. The following section discusses the multimodal travel activity at the four counted locations.

3.2.1 Alpine Road east of Westridge Road

Alpine Road east of Westridge Road is the gateway into the Town from the greater Peninsula subregion to the east and the Interstate 280, El Camino Real, and US-101 corridors. The Town’s Housing Element (2023) identifies several adjacent parcels as potential future housing sites in this section of Alpine Road: Ladera Church (10 units), Vacant Portion of Ford Park (50 units), Stanford Wedge Pending Project (39 units), and Glen Oaks (16 units)⁵.

Table 2 Multimodal Traffic Volumes at Alpine Road east of Westridge Road

| Day | Pedestrian | Bicycle | | Vehicle | | |
|------------------------|-------------|-------------|-----------------|---------------|------------------------|----------------------|
| | Daily Total | Daily Total | Peak Hour Total | Daily Total | AM Peak ¹ | PM Peak ² |
| Monday | 0 | 228 | 45 | 10,700 | 1040 | 1040 |
| Tuesday | 0 | 291 | 65 | 11,600 | 1050 | 1160 |
| Wednesday | 3 | 155 | 34 | 11,400 | 1050 | 1150 |
| Thursday | 1 | 227 | 34 | 11,700 | 1030 | 1170 |
| Friday | 1 | 266 | 61 | 12,100 | 1040 | 1200 |
| WEEKDAY AVERAGE | 1 | 233 | 48 | 11,500 | 1140 | 1140 |
| Saturday | 0 | 438 | 126 | 8,800 | 840 | |
| Sunday | 1 | 618 | 121 | 7,900 | 850 | |
| WEEKEND AVERAGE | 1 | 528 | 124 | 8,300 | 850³ | |

Source: Parametrix, Nov. 29-Dec 5, 2023.

1. Weekday AM Peak occurs between 7:45 and 9AM.
2. Weekday PM Peak occurs between 3:15 and 4:15PM .
3. Weekend daily peak occurs between Noon and 1:30PM.

Alpine Road here had the highest recorded daily and peak hour vehicle volumes among the Town counts (Table 2). The average bicycle activity recorded more than 200 people on bike on most weekdays and between four and six hundred people on bike on weekend days. There were fewer than five people recorded walking each day.

Figure 4 and Figure 5 show the daily traffic trends for bicycle and vehicle traffic, respectively.

⁵ Town of Portola Valley (2023) Portola Valley Housing Element. Figure 6-2, Adequate Housing Sites Inventory Map; Table 6-6: Adequate Sites Land Inventory.

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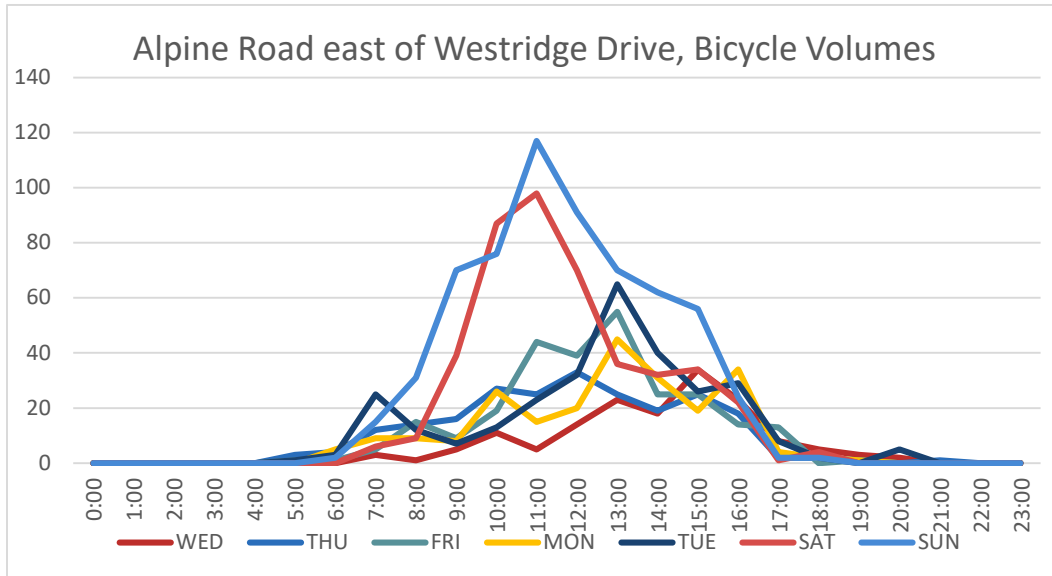


Figure 4 Alpine Road east of Westridge Drive, Bicycle Volumes
Source: Parametrix, Nov. 29-Dec 5, 2023.

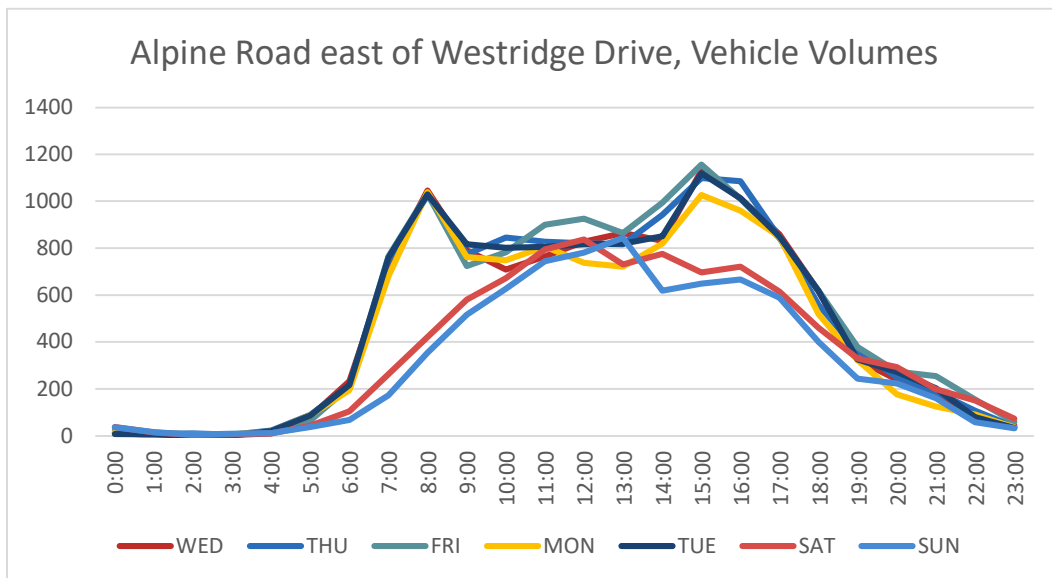


Figure 5 Alpine Road east of Westridge Drive, Vehicle Volumes
Source: Parametrix, Nov. 29-Dec 5, 2023.

This section of Alpine Road is a popular bicycling route on weekends, with activity peaking during the late morning. Weekday bicycle activity tended to peak in the early afternoon.

Vehicle activity on weekdays tends to follow a traditional commute peak hour pattern, with peaks during the morning and evening hours. Weekend day vehicle traffic peaks at around the weekday midday level but does not exhibit the same morning or evening peaks.

The vehicle capacity of collector roadways like Alpine Road can vary depending on the density of adjacent land uses and driveways, presence of slower-moving vehicles like trucks and people on bicycles, and other design factors. The Federal Highway Administration’s (FHWA) simplified capacity estimate for two-lane semirural roadways is approximately 14,000 daily vehicles at level of service (LOS) “D”, where conditions are slightly below capacity and approaching an unstable or congested condition.⁶ The average daily traffic recorded at this section of Alpine Road equates to LOS “C” conditions (volume to capacity ratio of 0.8) where there is stable operation, light congestion, and occasional backups on critical approaches.⁷

3.2.2 Alpine Road east of Nathhorst Avenue

Alpine Road east of Nathhorst Avenue lies along the north boundary of the Hawthorns Area. The roadway segment provides access to local trip destinations that include the Roberts Market retail area and the Alpine Hills Tennis and Swimming Club. There are three potential future housing sites identified in the Town’s Housing Element (2023) in this section of Alpine Road: 4370 Alpine Road (9 units), Willow Commons (13 units), and 4394 Alpine Road (21 units).⁸

Table 3 Multimodal Traffic Volumes at Alpine Road east of Nathhorst Avenue

| Day | Pedestrian | Bicycle | | Vehicle | | |
|------------------------|-------------|-------------|-----------------|--------------|------------------------|----------------------|
| | Daily Total | Daily Total | Peak Hour Total | Daily total | AM Peak ¹ | PM Peak ² |
| Monday | 61 | 280 | 65 | 7,000 | 880 | 770 |
| Tuesday | 57 | 465 | 122 | 7,200 | 790 | 760 |
| Wednesday | 77 | 166 | 30 | 7,100 | 790 | 710 |
| Thursday | 56 | 355 | 63 | 7,300 | 750 | 780 |
| Friday | 62 | 352 | 103 | 7,200 | 780 | 790 |
| WEEKDAY AVERAGE | 63 | 324 | 77 | 7,100 | 800 | 760 |
| Saturday | 48 | 703 | 179 | 4,800 | 460 | |
| Sunday | 61 | 1004 | 183 | 4,600 | 480 | |
| WEEKEND AVERAGE | 55 | 854 | 181 | 4,700 | 470³ | |

Source: Parametrix, Nov. 29-Dec 5, 2023.

1. Weekday AM Peak occurs between 8 and 9AM.
2. Weekday PM Peak occurs between 2:30 and 4:15PM.

⁶ Federal Highway Administration (2017) Simplified Highway Capacity Calculation Method. p. 33. Table 17. Rural two-lane highways generalized service volume table. https://www.fhwa.dot.gov/policyinformation/pubs/pl18003/hpms_cap.pdf

⁷ Transportation Research Board (1994) Highway Capacity Manual, Special Report 209.

⁸ Town of Portola Valley (2023) Portola Valley Housing Element. Figure 6-2, Adequate Housing Sites Inventory Map; Table 6-6: Adequate Sites Land Inventory.

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3. Weekend daily peak occurs between Noon and 1:30PM.

The average daily vehicle traffic here (Table 3) was lower than at Westridge Road (Table 2) by approximately 4,000 daily trips. Alpine Road here had the highest recorded bicycle activity among the November and December counts, with more than 300 people on bike on most weekdays and between 700 and 1,000 people on bike on weekend days. There were between 40 and 80 people recorded walking each day.

Figure 6 and Figure 7 show the daily traffic trends for bicycle and vehicle traffic, respectively.

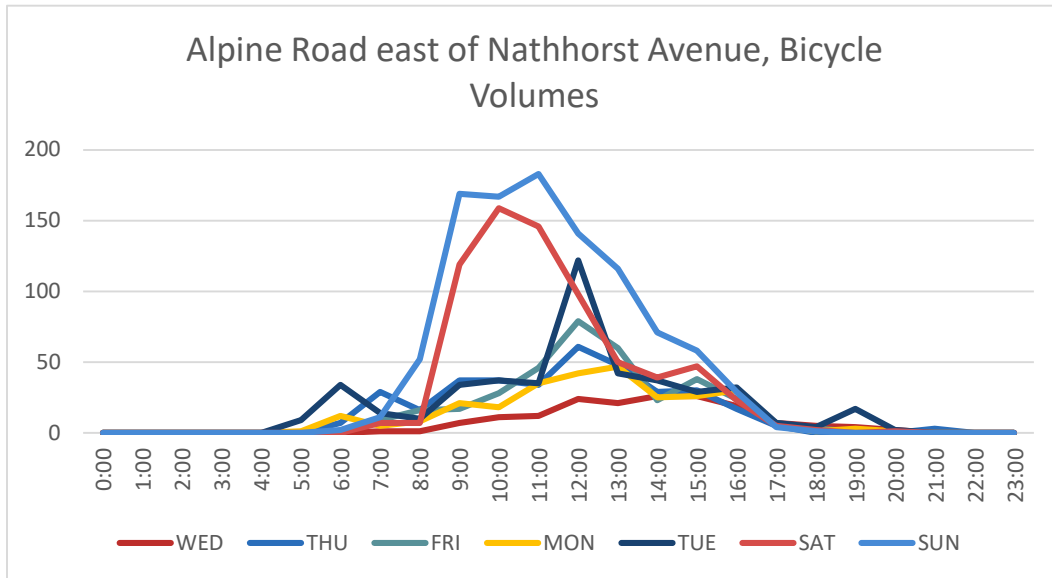


Figure 6 Alpine Road east of Nathhorst Avenue, Bicycle Volumes
Source: Parametrix, Nov. 29-Dec 5, 2023.

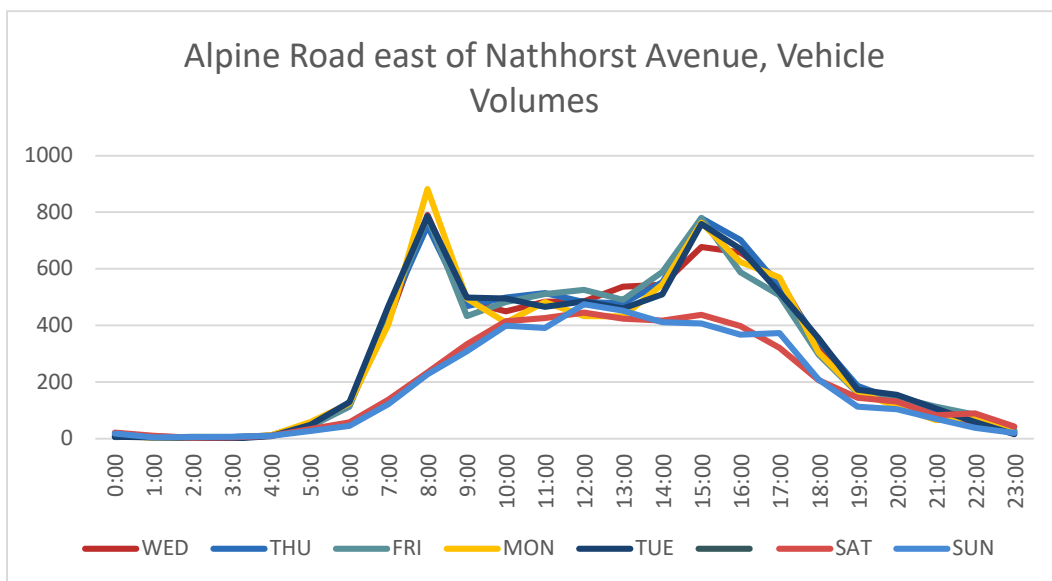


Figure 7 Alpine Road east of Nathhorst Avenue, Vehicle Volumes

Source: Parametrix, Nov. 29-Dec 5, 2023.

Like Alpine Road at Westridge Road, this section of Alpine Road is a popular bicycling route on weekends. Bicycle activity here tends to peak earlier in the morning, around 9AM on weekends and at around noon on weekdays. The traffic counters recorded a large group ride passing through Portola Valley on Tuesday at noon.

Vehicle activity on weekdays here tends to follow a traditional commute peak hour pattern, with peaks during the morning (8-9AM) and evening hours (3-4PM). The weekend day vehicle traffic peaks at around the weekday midday level but does not exhibit the same morning or evening peaks. The average daily traffic recorded at this section of Alpine Road equates to LOS “A” conditions (volume to capacity ratio <0.6) where there are free-flow conditions, although occasional congestion may occur during peak commute times and due to other non-vehicle factors like group bicycle rides.

3.2.3 Alpine Road west of Portola Road

Alpine Road west of Portola Road provides local access to the Windy Hill Open Space Preserve and the Los Trancos Woods neighborhood. There are primarily residential land uses along this section of Alpine Road, and the road does not connect directly to Skyline Boulevard / Highway 35 to the west.

Table 4 Multimodal Traffic Volumes at Alpine west of Portola Road

| Day | Pedestrian | Bicycle | | Vehicle | | |
|------------------------|-------------|-----------------|-----------------|--------------|------------------------|----------------------|
| | Daily Total | Peak Hour Total | Peak Hour Total | Daily total | AM Peak ¹ | PM Peak ² |
| Monday | 33 | 98 | 19 | 2,800 | 480 | 270 |
| Tuesday | 18 | 150 | 29 | 2,900 | 490 | 280 |
| Wednesday | 19 | 45 | 12 | 2,800 | 470 | 260 |
| Thursday | 14 | 118 | 26 | 2,900 | 470 | 270 |
| Friday | 24 | 140 | 34 | 2,900 | 480 | 290 |
| WEEKDAY AVERAGE | 22 | 110 | 24 | 2,900 | 480 | 280 |
| Saturday | 21 | 172 | 46 | 2,000 | 210 | |
| Sunday | 27 | 277 | 63 | 1,800 | 190 | |
| WEEKEND AVERAGE | 24 | 225 | 55 | 1,900 | 200³ | |

Source: Parametrix, Nov. 29-Dec 5, 2023.

1. Weekday AM Peak occurs between 7:45 and 8:45AM.
2. Weekday PM Peak occurs between 2:30 and 4PM.
3. Weekend daily peak occurs between 12:30 and 1:30PM.

This count location (Table 4) has 60% less vehicle traffic and experiences about one-third of the bicycle and walk activity traffic compared to the section of Alpine Road near Nathhorst Avenue (Table 3).

Figure 8 and Figure 9 show the daily traffic trends for bicycle and vehicle traffic, respectively.

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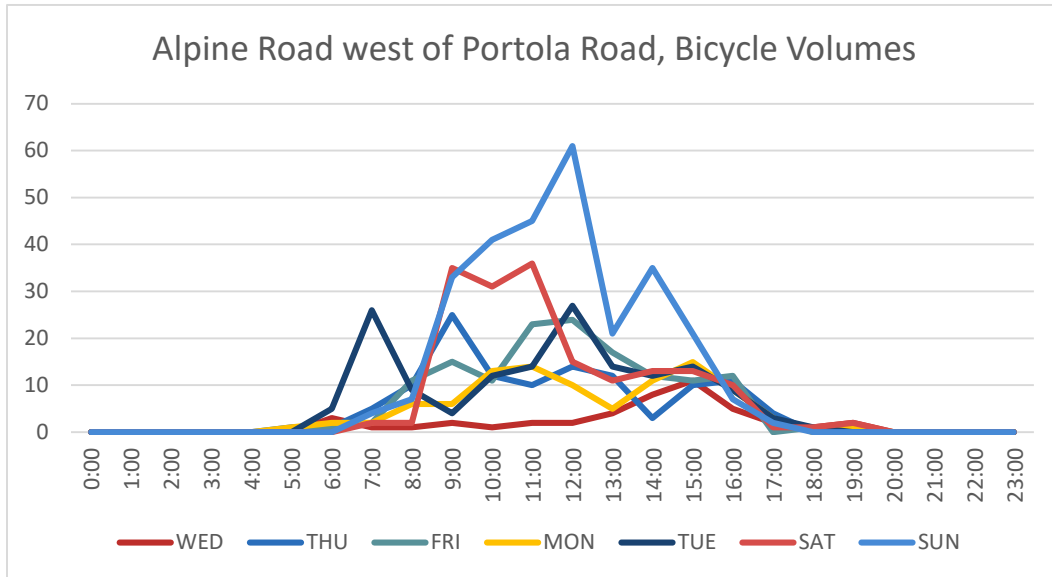


Figure 8 Alpine Road west of Portola Road, Bicycle Volumes
Source: Parametrix, Nov. 29-Dec 5, 2023.

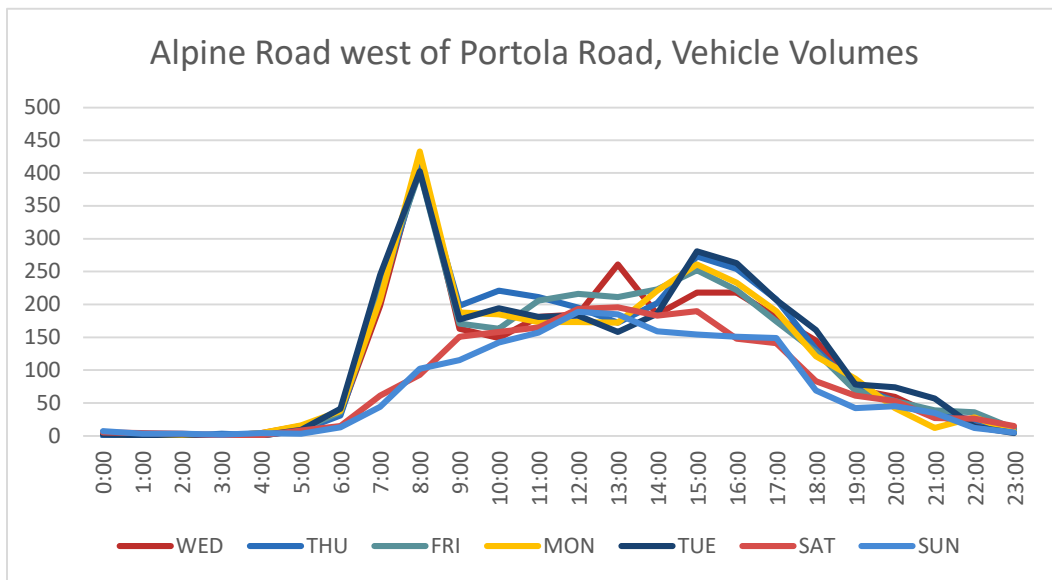


Figure 9 Alpine Road west of Portola Road, Vehicle Volumes
Source: Parametrix, Nov. 29-Dec 5, 2023.

This section of Alpine Road exhibits the same weekday and weekend day peak periods as Alpine Road east of Nathhorst Avenue but experiences less multimodal traffic befitting its role as a local access route. The average daily traffic recorded at this section of Alpine Road equates to LOS “A” conditions (volume to capacity ratio <0.6) where there are free-flow conditions.

3.2.4 Los Trancos Road near the Town Limit

Los Trancos Road runs along the east border of the Hawthorns Area and provides local access to the Los Trancos Woods neighborhood. Like the portion of Alpine Road west of Portola Road, there are primarily residential land uses along Los Trancos Road, and the road does not connect directly to Skyline Boulevard / Highway 35 to the west.

Table 5 Multimodal Traffic Volumes at Los Trancos Road near the Town Limit

| Day | Pedestrian | Bicycle | | Vehicle | | |
|------------------------|-------------|-------------|-----------------|--------------|------------------------|----------------------|
| | Daily Total | Daily Total | Peak Hour Total | Daily Total | AM Peak ¹ | PM Peak ² |
| Monday | 3 | 27 | 8 | 1,900 | 200 | 200 |
| Tuesday | 0 | 25 | 7 | 1,900 | 180 | 180 |
| Wednesday | 11 | 16 | 7 | 1,900 | 200 | 180 |
| Thursday | 3 | 25 | 8 | 2,000 | 210 | 200 |
| Friday | 3 | 45 | 19 | 2,000 | 180 | 200 |
| WEEKDAY AVERAGE | 4 | 28 | 10 | 1,900 | 200 | 191 |
| Saturday | 12 | 53 | 23 | 1,500 | 150 | |
| Sunday | 2 | 68 | 24 | 1,400 | 150 | |
| WEEKEND AVERAGE | 7 | 61 | 24 | 1,400 | 150³ | |

Source: Parametrix, Nov. 29-Dec 5, 2023.

1. Weekday AM Peak occurs between 8 and 9AM.
2. Weekday PM Peak occurs between 3:15 and 4:30PM.
3. Weekend daily peak occurs between 2 and 3:15PM.

Los Trancos Road handles approximately one third less vehicle traffic than Alpine Road west of Portola Road and 70 percent less bicycle traffic (Table 5).

Figure 10 and Figure 11 show the daily traffic trends for bicycle and vehicle traffic, respectively.

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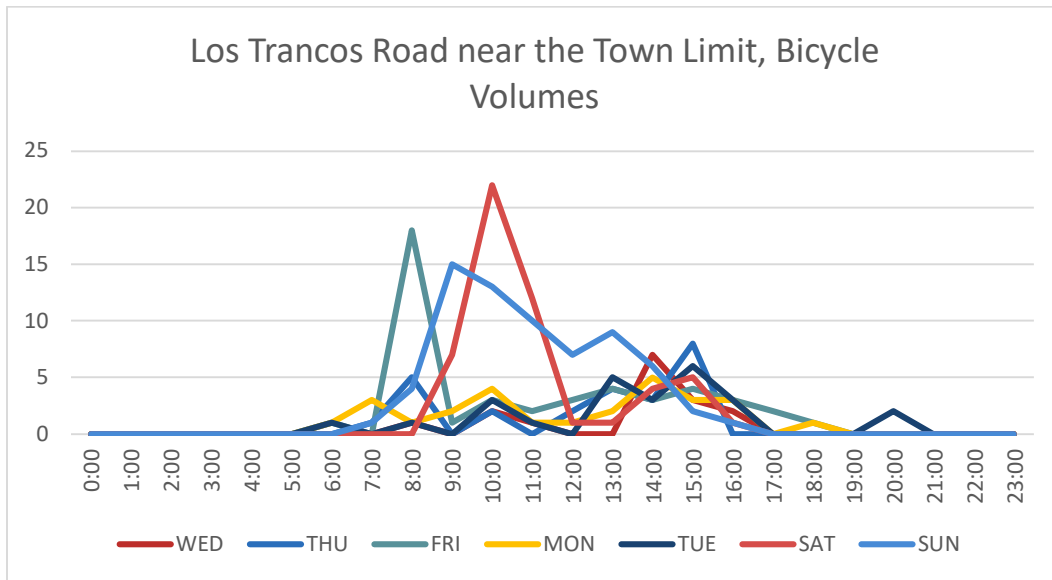


Figure 10 Los Trancos Road near the Town Limit, Bicycle Volumes
Source: Parametrix, Nov. 29-Dec 5, 2023.

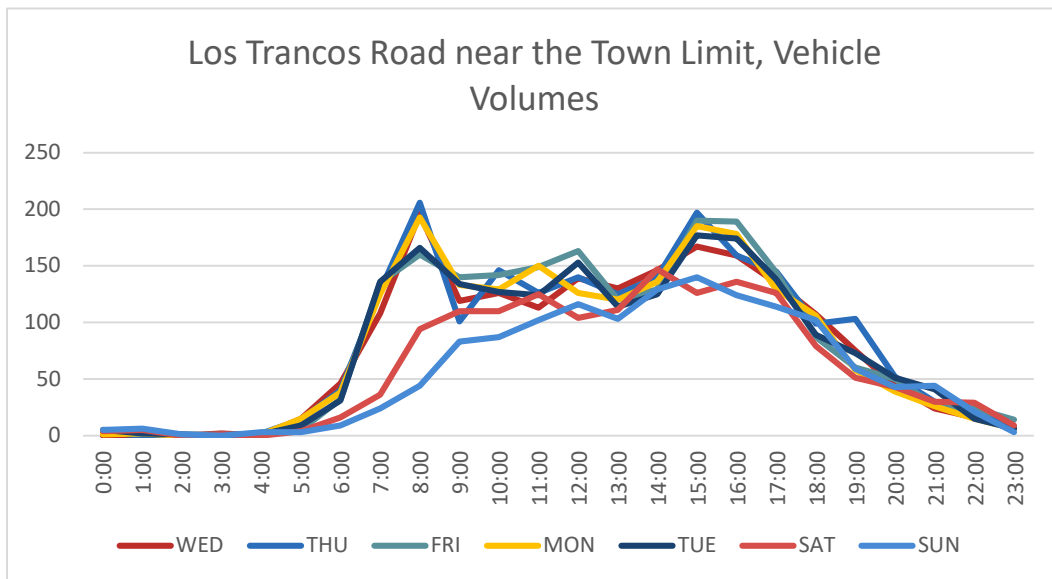


Figure 11 Los Trancos Road near the Town Limit, Vehicle Volumes
Source: Parametrix, Nov. 29-Dec 5, 2023.

Los Trancos Road exhibits the same weekday and weekend day peak periods as the other counts collected in Portola Valley. Like Alpine Road west of Portola Road, Los Trancos Road has low traffic demand as it primarily serves local residential traffic. The average daily traffic recorded at this section of Los Trancos Road equates to LOS “A” conditions (volume to capacity ratio <0.6) where there are free-flow conditions.

3.3 Vehicle and Bicycle Adjustment Factors, 2019-2023

Parametrix consulted Replica, an online traffic data provider, to assess whether the differences from the 2019 and 2023 counts reflect multiyear or seasonal trends. Replica provided traffic volume estimates for Spring and Fall 2021 through 2023 (Table 6). For one sampled location at Alpine Road, east of Portola Road, vehicle traffic peaked in Fall 2021 but has since dropped. The Replica estimates for Spring 2023 are slightly lower than the weekday count at Nathhorst Avenue (Table 1, location 2, 6,900 vs 7,100) and higher than the weekend day count (6,000 vs 4,800). As such, the Nov./Dec. 2023 weekday counts appear representative of an average annual condition, but the weekend day counts may be lower due to the winter season and a lower level of recreational trips.

Table 6 Alpine Road west of Portola Road, Vehicle Average Daily Traffic (ADT) Volumes, 2021 to 2023

| Season | Thursday 2-Way | Saturday 2-Way |
|-------------|--------------------|----------------|
| Spring 2021 | 7,800 | 7,400 |
| Fall 2021 | 8,200 | 7,900 |
| Spring 2022 | Data not available | |
| Fall 2022 | 6,700 | 5,800 |
| Spring 2023 | 6,900 | 6,000 |

Source: Replica (www.replicahq.com)

Parametrix consulted Strava, a walk and bike-oriented online data provider, to assess how the recorded bicycle activity compares to other years and seasons. The Strava data show that bicycle activity tends to peak in the summer months (May through July), with greater activity recorded during 2020 and 2021, the peak of the COVID-19 pandemic. Bicycle activity has since receded to slightly above 2019 pre-pandemic levels.

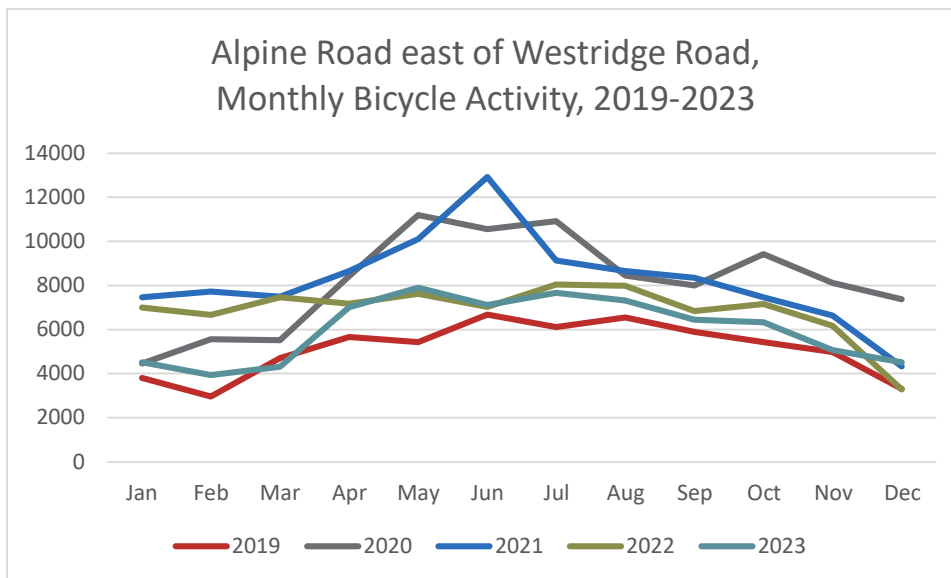


Figure 12 Alpine Road east of Westridge Drive, Monthly Bicycle Activity, 2019-2023

Source: Stravametro.com, Jan. 2019 through Dec. 2023

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For 2023, annual average bicycle activity is approximately 30% greater than December levels. The peak summer activity occurring between May and August is 50-85% greater than December levels.

Table 7 presents bicycle activity adjusted to annual average and summer peak conditions based on the data from the November and December 2023 counts factored up from the calculated Strava seasonal adjustment factors.

Table 7 Annually Adjusted 2023 Bicycle Activity

| | Seasonal Adjustment Factor | Weekday Daily Total | | | Weekend Daily Total | | |
|---|--|---------------------|------------------|------------------|---------------------|------------------|------------------|
| | | N/A | 30% | 70% | N/A | 30% | 70% |
| # | Roadway Segment | Dec. Count | Annual Avg. Est. | Summer Peak Est. | Dec. Count | Annual Avg. Est. | Summer Peak Est. |
| 1 | Alpine Road east of Westridge Road | 233 | 300 | 400 | 528 | 690 | 900 |
| 2 | Alpine Road east of Nathhorst Avenue | 324 | 420 | 550 | 854 | 1110 | 1450 |
| 3 | Alpine Road west of Portola Road | 110 | 140 | 190 | 225 | 290 | 380 |
| 4 | Los Trancos Road south of Alpine Road | 28 | 40 | 50 | 61 | 80 | 100 |
| 5 | Portola Road north of Alpine Road ¹ | N/A | 450 | 590 | N/A | 1190 | 1550 |

Source: Parametrix, 2024.

1. Estimated from Strava data and the Alpine Road count east of Nathhorst Avenue.

The Town identified Portola Road, north of Alpine Road, as a bicycle route of interest by the Town after Parametrix collected the November and December 2023 counts. The Strava data estimates that Portola Road has higher bicycle activity than Alpine Road, east of Nathhorst Avenue, by seven percent. The count data presented above includes Portola Road's estimated weekday and weekend day bicycle activity.

3.4 Collision History

Using data from Statewide Integrated Traffic Records Systems (SWITRS) reports, Parametrix completed a collision analysis for the Hawthorns Area spanning from 2016 to 2022. The traffic crash records from 2023 are not yet available from the California Highway Patrol collision records database (SWITRS). The collision analysis study area for the Hawthorns Area includes Alpine Road from Echo Lane to Golden Oak Drive (0.7 mile) and Los Trancos Road from Alpine Road to the Town limit (0.4 mile). There were 13 collisions in total, including three at the Alpine Road / Los Trancos Road intersection (Table 8).

The collision rate along Alpine Road is slightly higher than the Statewide average rate for comparable rural highways (0.86 vs. 0.82) but is more than 30 percent lower than the collision rate on Los Trancos Road (0.86 vs. 1.30). There were four bicyclist-involved collisions, including two severe injury crashes, and no pedestrian-involved collisions. The reasons for collisions were unsafe speed (five crashes), automobile right of way (four crashes), improper turning (three crashes) and one collision due to hazardous parking.

These data indicate that measures to reduce vehicle speeds, like warning signs and refreshed pavement markings, providing greater separation between drivers and bicyclists, and maintaining or improving sight distance should be incorporated in the design for a future driveway entrance for public access into the Hawthorns Area.

Table 8 Hawthorns Area Roadway Collision Rates

| Roadway Segment | A | B | C over 7 years | $D = \frac{C \times 1,000,000}{[(B \times 365 \times 7 \text{ yrs}) \times (A)]}$ | Statewide Average Collision Rate (c/mvm)** |
|--|---|------|-----------------|---|--|
| | Length (miles) | ADT | # of Collisions | Collision Rate (c/mvm)*** | |
| Alpine Road, Saddleback Drive to Golden Oak Drive | 0.7 | 7800 | 12* | 0.86 | 0.82 |
| Los Trancos Road, Alpine Road to Town Limits (Rolling Terrain) | 0.4 | 3000 | 4 * | 1.30 | 1.19 |
| 2-Lane Highway, Rural, Flat Terrain, <55 MPH | Collision rate applied to Alpine Road. | | | | 0.78+(.35/ADT in thousands) |
| 2-Lane Highway, Rural, Rolling Terrain, < 55 MPH | Collision rate applied to Los Trancos Road. | | | | 1.07+(.35/ADT in thousands) |

*Three collisions at the Alpine Rd. / Los Trancos Road intersection

**Rates from Caltrans 2016 Collision Data on California State Highways.

*** c/mvm – Collisions per Million Vehicle Miles, calculated as

$[\text{Collisions} \times 1,000,000] / [\text{Average Daily Traffic} \times 365 \text{ days} \times \# \text{ of study years} \times \text{Roadway Segment Length}]$

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4. Existing Project Area Vehicle Parking Conditions

This section details the results of a parking demand analysis performed for parking lots in the area surrounding the Hawthorns Area of the Windy Hill Open Space Preserve in Portola Valley, CA.

For the Fall 2022 count, parking data was taken for six parking lots on Thursday, October 20th and Saturday, October 22nd, from 7:30 AM to 7:30 PM.

For the Summer 2023 count, parking data was taken for seven parking lots on Thursday, May 18th and Saturday, May 20nd, from 7:30 AM to 7:30 PM. Parking data was also taken on Thursday, June 22nd and Saturday, June 24th, from 7:30 AM to 7:30 PM, for locations 1 and 2.

The seven lots are at:

1. Lower Windy Hill (Windy Hill Preserve)
2. Alpine Trail (Windy Hill Preserve)
3. Anniversary Trail (Windy Hill Preserve)
4. Spring Ridge (Windy Hill Preserve)
5. Thornewood Parking Area (Thornewood Preserve)
6. Bridle Trailhead (Thornewood Preserve)
7. Roberts Market (Summer 2023 only)

See Figure 13 for the parking lot locations and an overview map and Table 9 for a summary comparison of the occupancy and parking duration.

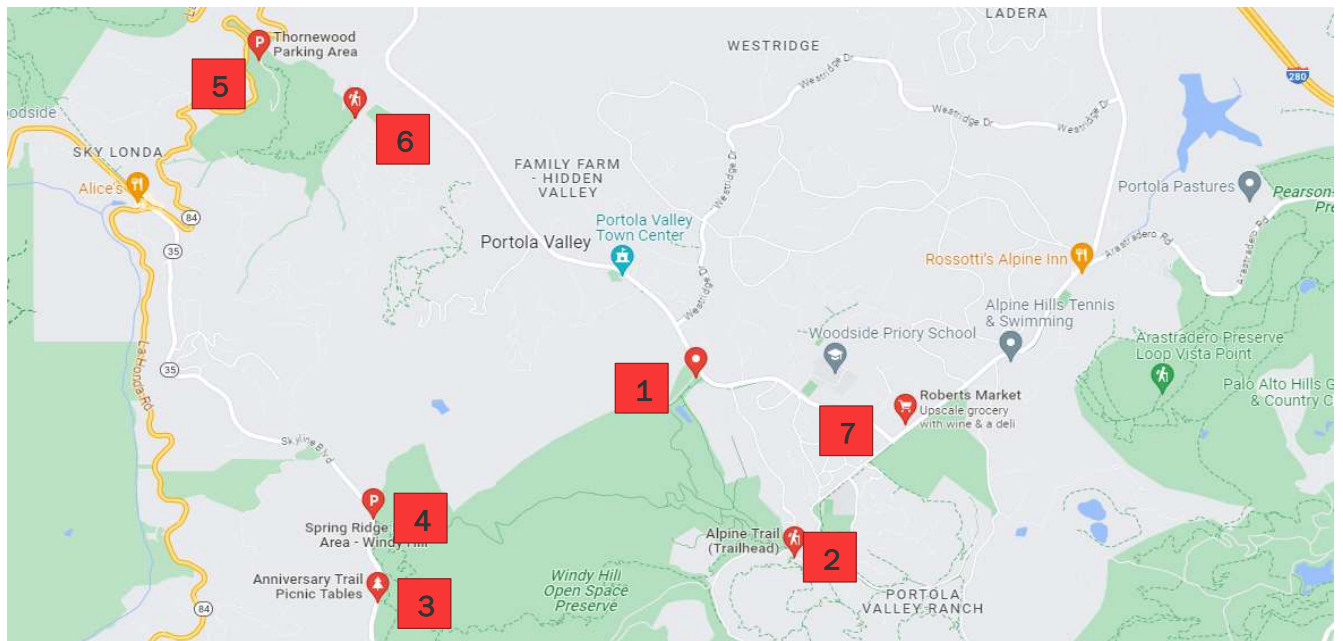


Figure 13 Parking Lot Overview Map
Source: Google

Table 9 Hawthorns Parking Occupancy and Duration Summary (2022 & 2023)

| Location | Capacity | Hours with > 50% Occupancy | | | | Average Parking Duration (Hours) | | | |
|---|-----------------------|---|-------------|-----------|-------------|----------------------------------|-------------|-----------|-------------|
| | | Thursday | | Saturday | | Thursday | | Saturday | |
| | | Fall 2022 | Summer 2023 | Fall 2022 | Summer 2023 | Fall 2022 | Summer 2023 | Fall 2022 | Summer 2023 |
| Lower Windy Hill (Windy Hill Preserve) ¹ | 50 | 1 | 0-2 | 8 | 6-8 | 1.8 | 1.6-1.9 | 2.2 | 2.2 |
| Alpine Trail (Windy Hill Preserve) ² | 13 | 7 | 9 | 10 | 12 | 1.6 | 1.8 | 2.2 | 2.2 |
| Anniversary Trail (Windy Hill Preserve) | 12 | 0 | 3 | 4 | 4 | 1.9 | 2.4 | 1.6 | 1.6 |
| Spring Ridge (Windy Hill Preserve) | 25 | 0 | 0 | 0 | 1 | 1.0 | 1.2 | 1.4 | 1.3 |
| Thornewood Parking Area (Thornewood Preserve) | 11 | 0 | 0 | 2 | 0 | 1.5 | 2.0 | 1.4 | 1.5 |
| Bridle Trailhead (Thornewood Preserve) | 10 | 0 | 2 | 8 | 7 | 1.2 | 1.7 | 1.4 | 1.5 |
| Roberts Market ³ | 54-space customer lot | -- | 0 | -- | 1 | -- | 1.3 | -- | 1.4 |
| | 46-space employee lot | Not collected at Roberts Market's request | | | | | | | |

Source: Fall 2022 data collected by Mead & Hunt, Summer 2023 data collected by Parametrix
 Unless indicated with footnotes below, Fall 2022 data were collected in October 2022 and Summer 2023 data were collected in May 2023.

1. Data were collected here in May and June 2023.
2. Data were collected here in June 2023 only due to a data collection error in May.
3. Data was not collected in October 2022.

Thursdays in May 2023 tended to have more locations where the parking lot occupancy exceeded 50% than October 2022. Saturdays in October tended to have more locations where the parking lot occupancy exceeded 50% than May 2023.

Parking durations tended to be the same or higher in May 2023 compared to October 2022 in most cases, although the differences tended to be minor, e.g. less than a half hour.

The subsequent sections contain more detailed figures and summary statistics for parking lot occupancy, utilization, and vehicle duration data for each location.

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4.1 Lower Windy Hill (Windy Hill Preserve)

The Lower Windy Hill parking lot has an estimated 50 parking spaces (including two accessible spaces) and a restroom in the gravel lot (Figure 14). The parking area at the lower portion of the preserve is located on Portola Road.



Figure 14 Parking Lot at Lower Windy Hill (Windy Hill Preserve)
Source: Google

4.1.1 Fall 2022

The parking lot had greater than 50% utilization for one hour on Thursday and eight hours on Saturday (Figure 15). The average parking duration was 1.8 hours on Thursday, October 20th and 2.2 hours on Saturday, October 22nd (Figure 16). Parking demand tends to be highest beginning at 8:30am and tapering after 1:30pm. Greater parking lot utilization was recorded on the Saturday. Parking data was also recorded for the shoulders of Portola Road, near the Lower Windy Hill lot (Figure 17). The peak timing for occupancy on Portola Road is similar to the demand for Lower Windy Hill lot, with the number of cars parked on the shoulder highest at 11:30 AM.

4.1.2 Summer 2023

The lot had greater than 50% utilization for eight hours on Saturday (Figure 18). The average parking duration was 1.6 hours on Thursday, May 18th and 2.2 hours on Saturday, May 20th (Figure 19). Parking demand tends to be highest beginning at 8:30am and tapering after 1:30pm.

The Lower Windy Hill parking lot and shoulder parking data were collected again on Thursday, June 22nd and Saturday, June 24th, 2023, alongside the Alpine Trail counts. The lot had greater than 50% utilization for six hours on the Saturday in June (Figure 20). The average parking duration was 1.9 hours on Thursday and 2.2 hours on Saturday (Figure 21). The daily parking pattern follows a slightly different trend between May and June, but generally shows similar duration and peak utilization results. Greater parking lot utilization was recorded on the Thursday in June.

Parking data was recorded for the shoulders of Portola Road in June (Figure 22). This Summer 2023 Portola Road shoulder parking data closely matches October 2022 data in the overall daily trend and the peak number of vehicles.

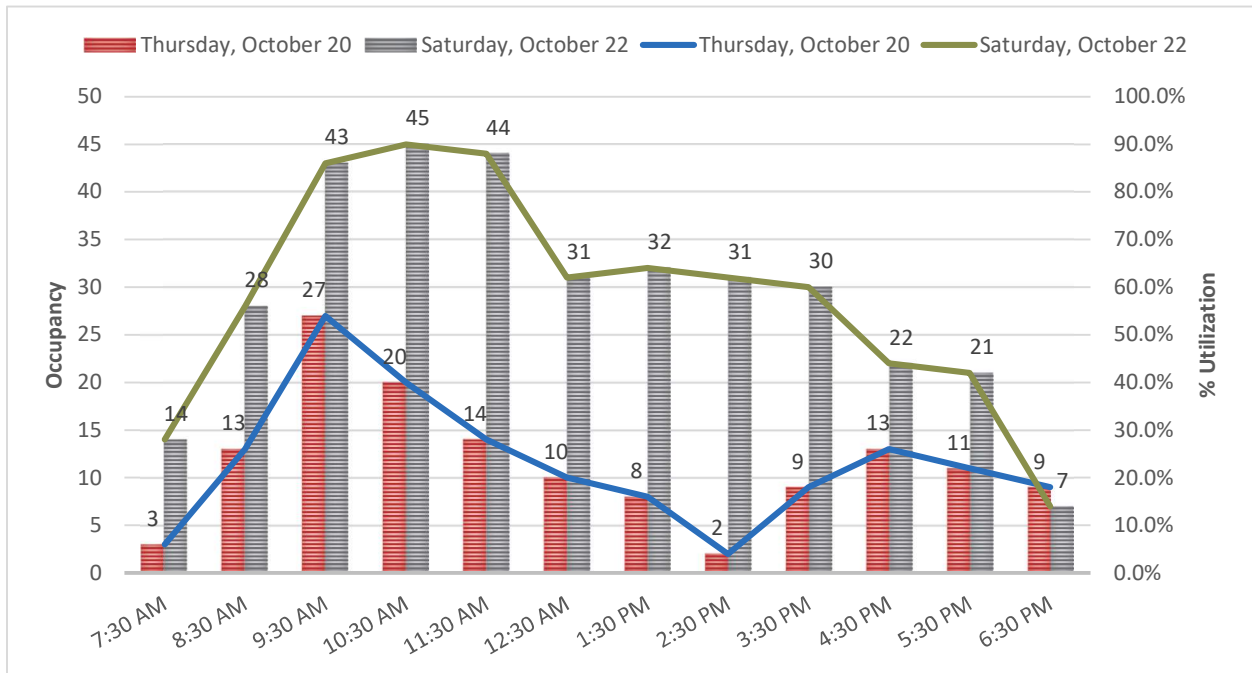


Figure 15 Lower Windy Hill Parking Lot Utilization and Occupancy – Fall 2022
 Source: Mead & Hunt

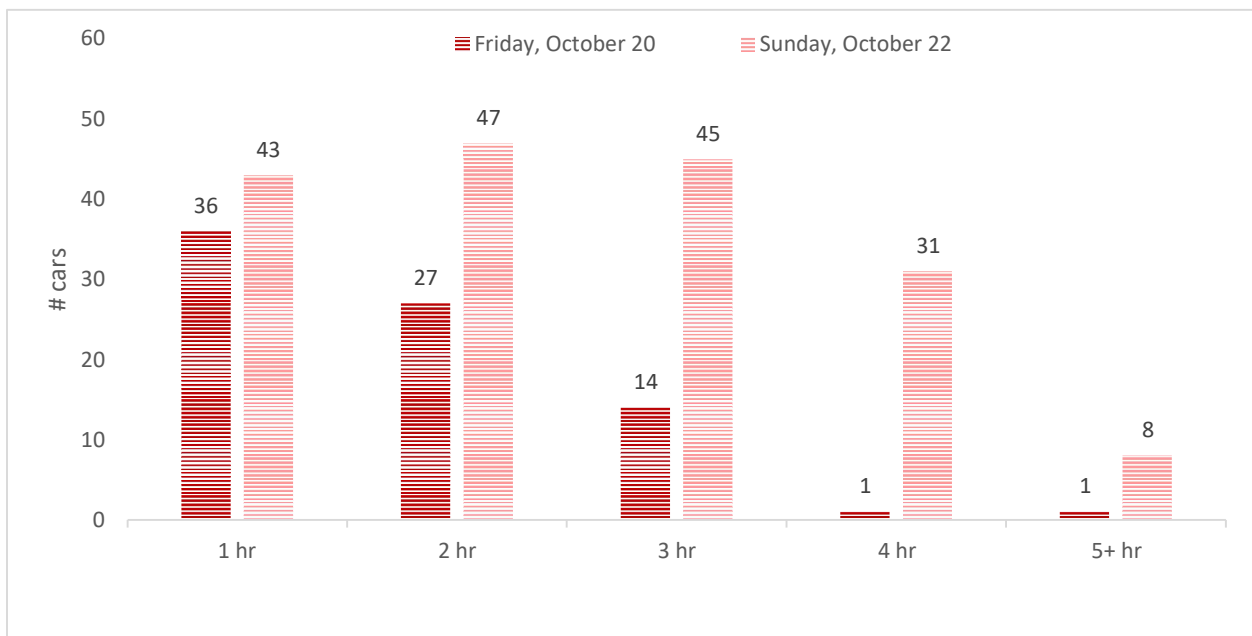


Figure 16 Lower Windy Hill Parking Lot Parking Duration – Fall 2022
 Source: Mead & Hunt

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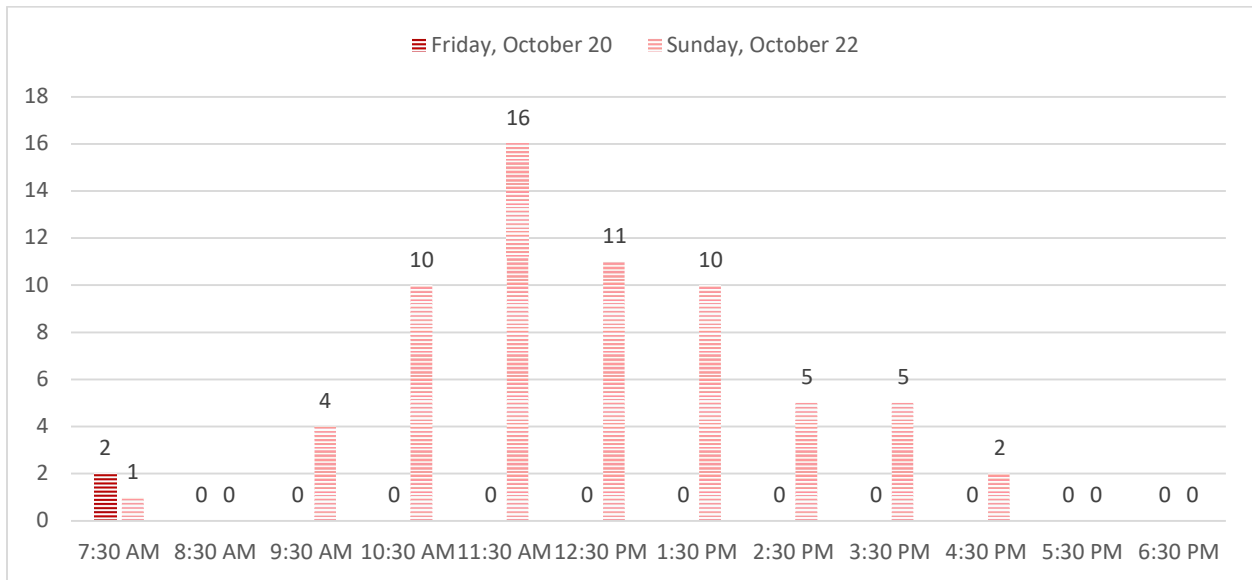


Figure 17 Lower Windy Hill Shoulder Parking on Portola Road – Fall 2022
 Source: Mead & Hunt

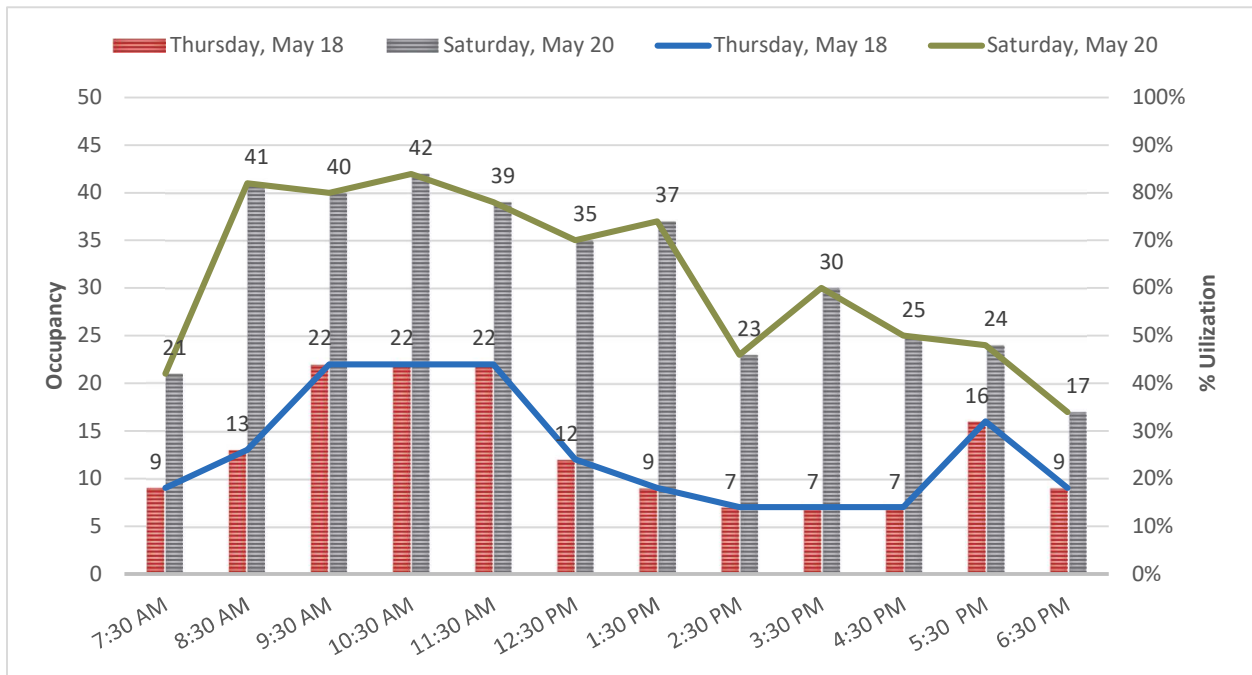


Figure 18 Windy Hill Parking Lot Utilization and Occupancy – Summer (May) 2023
 Source: Parametrix

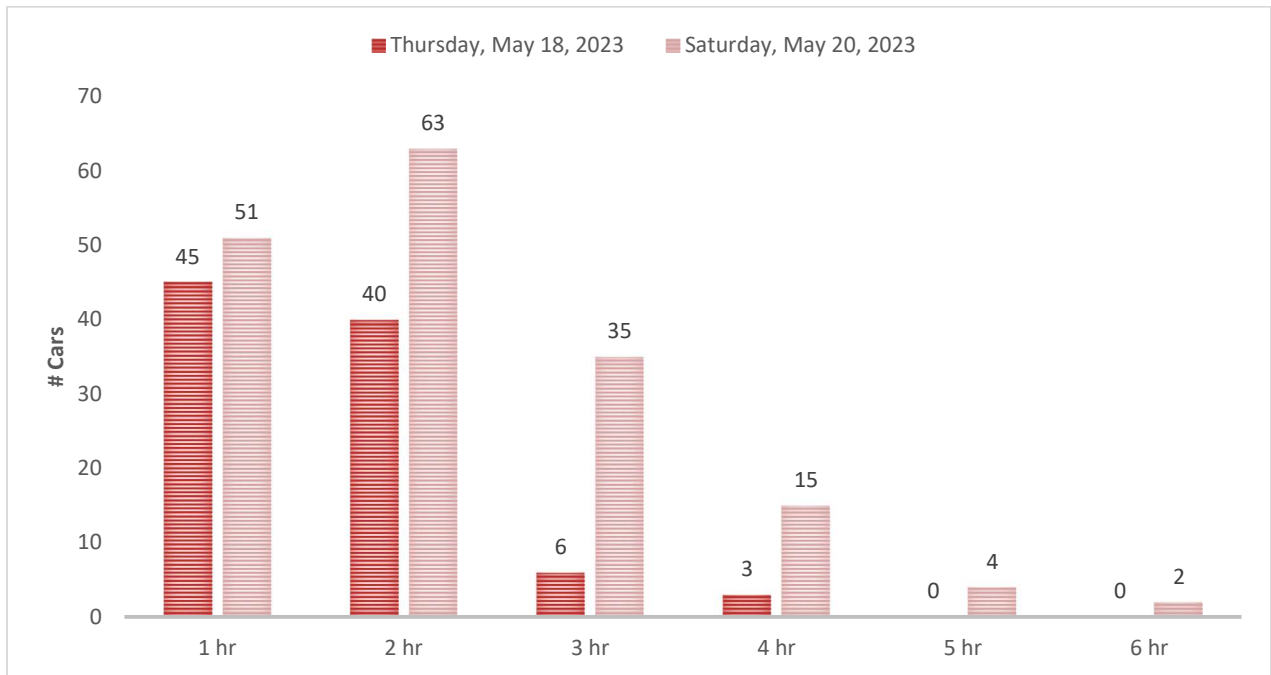


Figure 19 Windy Hill Parking Lot Parking Duration – Summer (May) 2023
 Source: Parametrix

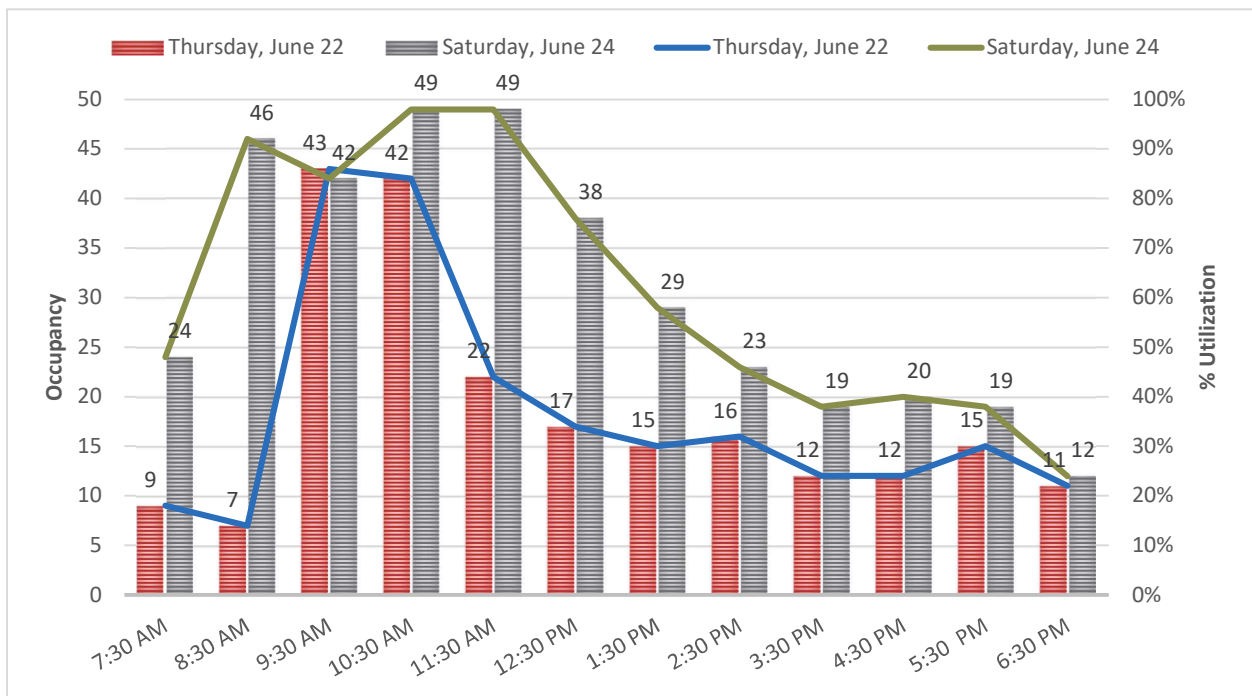


Figure 20 Windy Hill Parking Lot Utilization and Occupancy – Summer (June) 2023
 Source: Parametrix

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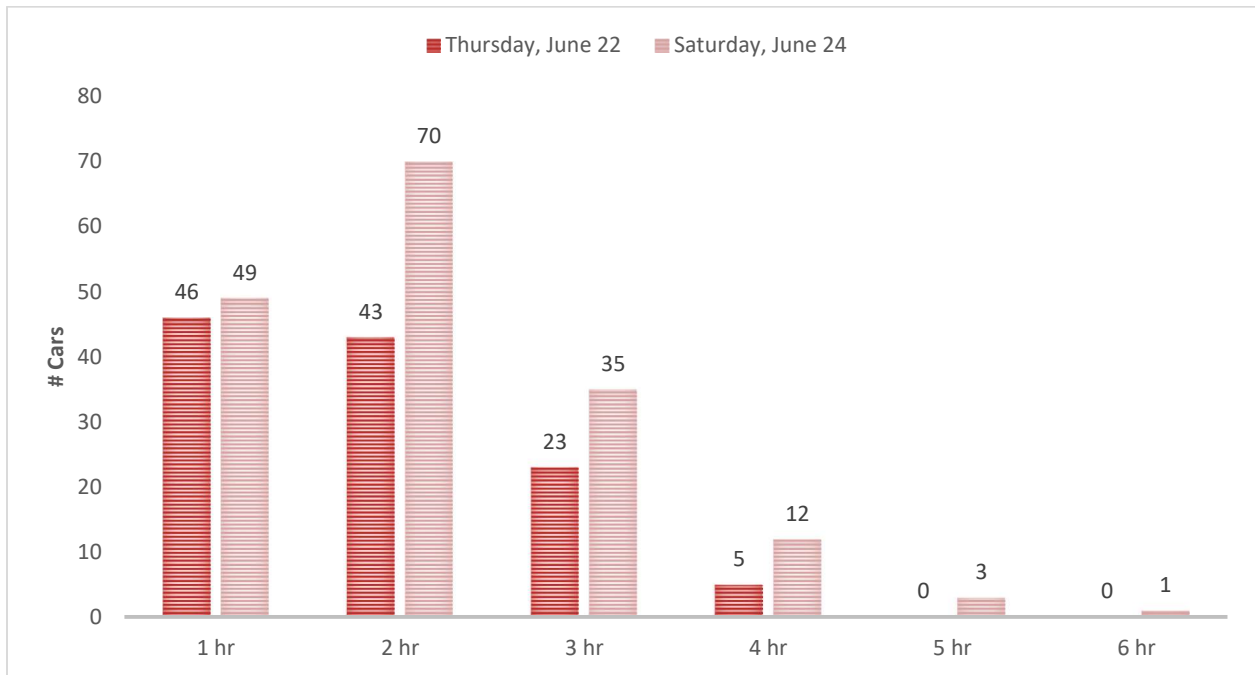


Figure 21 Windy Hill Parking Lot Parking Duration – Summer (June) 2023
 Source: Parametrix

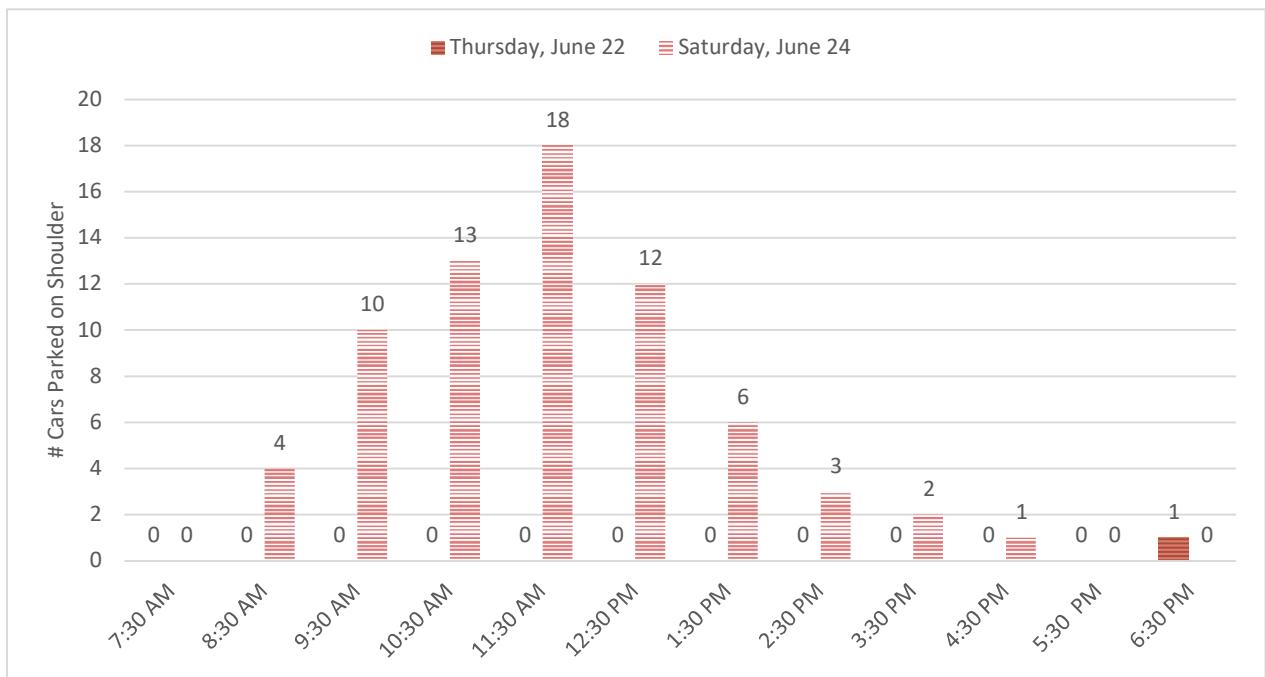


Figure 22. Windy Hill Shoulder Parking on Portola Road – Summer (June) 2023
 Source: Parametrix

4.2 Alpine Trail (Windy Hill Preserve)

The Alpine Trail lot has an estimated 13 gravel parking spaces located at the trailhead at the corner of Willowbrook Drive and Alpine Road (Figure 23).

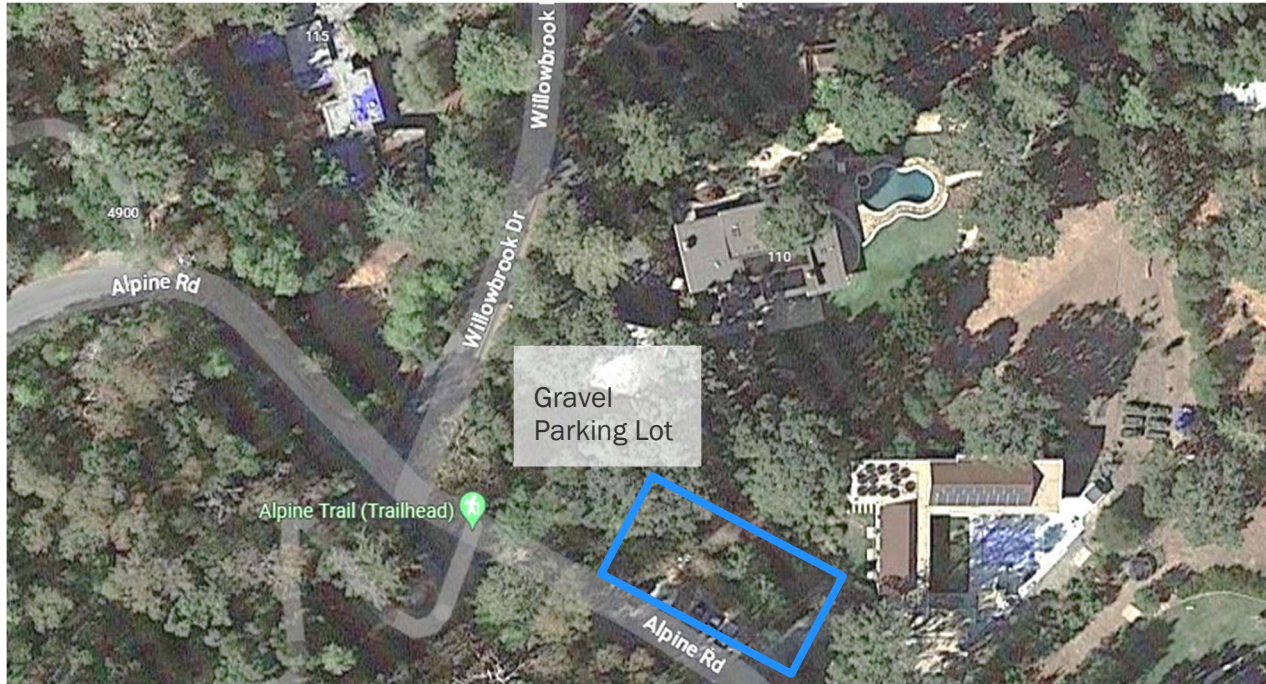


Figure 23 Parking Lot at Alpine Trail (Windy Hill Preserve)
Source: Google

4.2.1 Fall 2022

The parking lot had greater than 50% utilization for seven hours on Thursday and for 10 hours on Saturday (Figure 24). The average duration was 1.6 hours on Thursday, October 20th and 2.2 hours on Saturday, October 22nd (Figure 25). Parking data were collected on the shoulders of Alpine Road and Willowbrook Drive, adjacent to the trailhead (Figure 26). The peak shoulder parking was seven vehicles on Thursday and 38 vehicles on Saturday.

4.2.2 Summer 2023

Due to a data collection error in May at the Alpine Trailhead location, data were collected only on Thursday, June 22nd and Saturday, June 24th. This data was validated using the surveys done in May and June at the Windy Hill lot. Based on the comparable May and June Windy Hill data, it is assumed that the Alpine Trail June data represents typical summer 2023 parking patterns. See Chapter 1 for a comparison of the Windy Hill counts collected in May and June.

The lot had greater than 50% utilization for nine hours on Thursday and all 12 sampled hours on Saturday (Figure 27). The average duration was 1.8 hours on Thursday, October 20th and 2.2 hours on Saturday, October 22nd (Figure 28). Parking data were collected on the shoulder of Alpine Road and Willowbrook Drive (Figure 29). There were at most 17 vehicles on Thursday and 70 vehicles on Saturday. The Saturday shoulder parking nearly reached 160 Willowbrook Drive, approximately 1,100 feet north of the trailhead.

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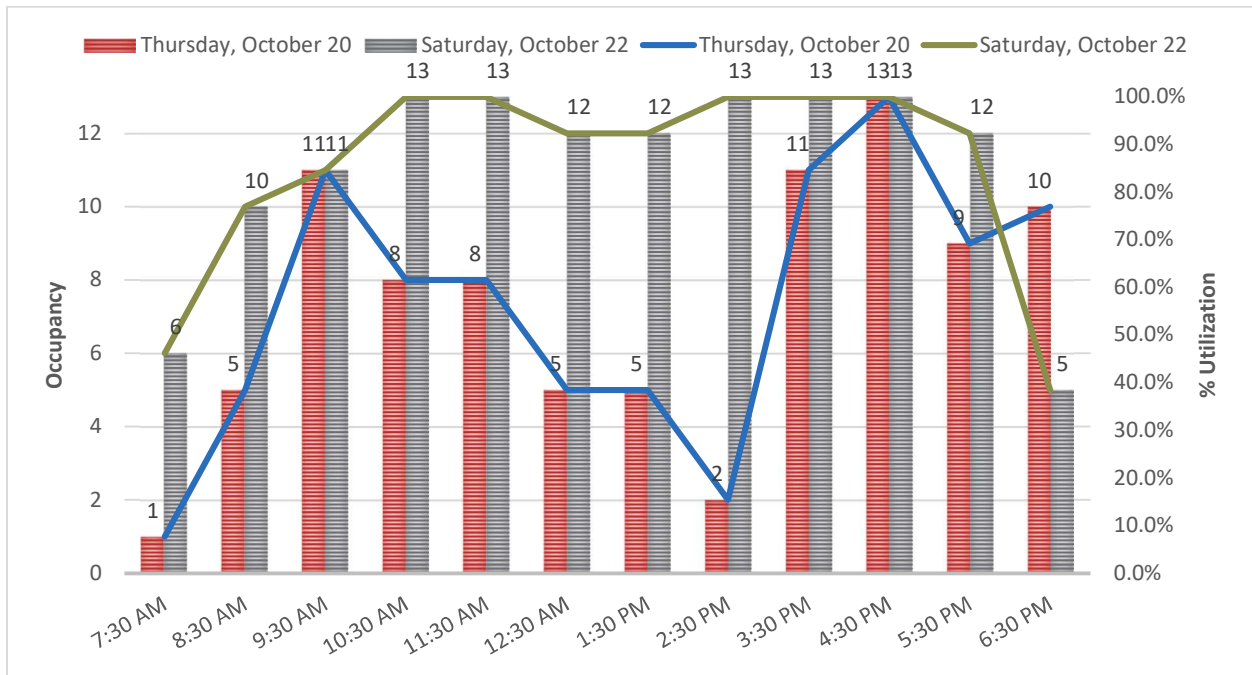


Figure 24 Alpine Trailhead Parking Lot Utilization and Occupancy – Fall 2022
 Source: Mead & Hunt

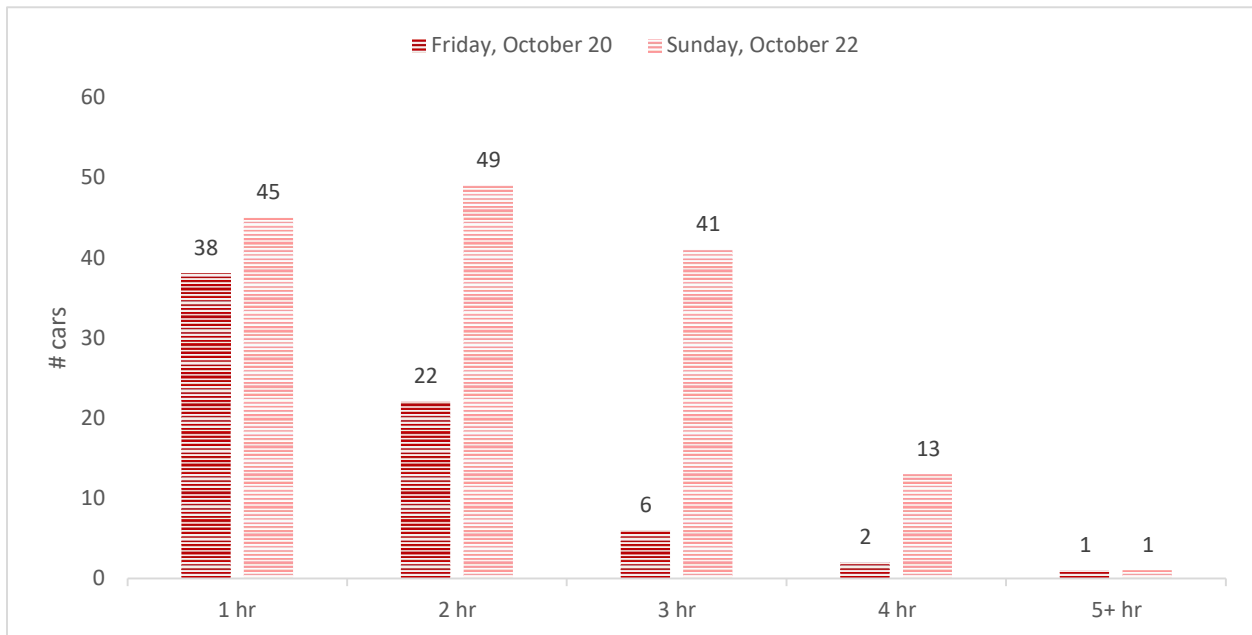


Figure 25 Alpine Trailhead Parking Lot Parking Duration – Fall 2022
 Source: Mead & Hunt

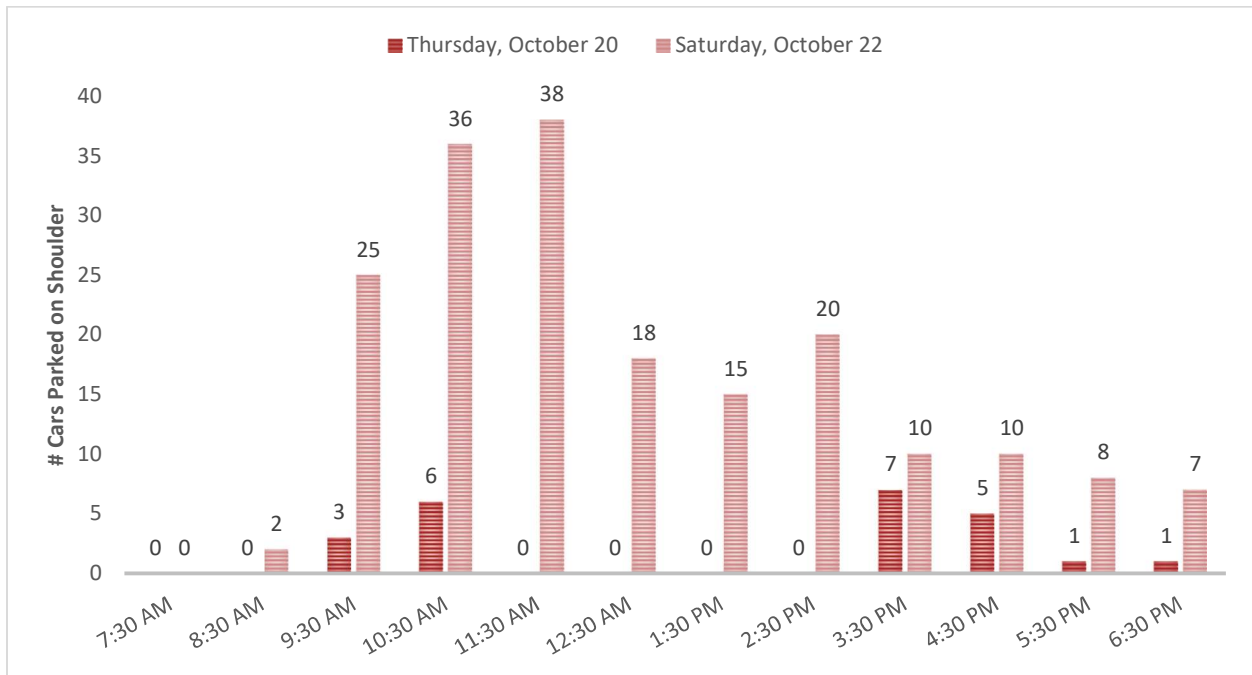


Figure 26 Alpine Trailhead Shoulder Parking, Alpine Road and Willowbrook Drive – Fall 2022
 Source: Mead & Hunt

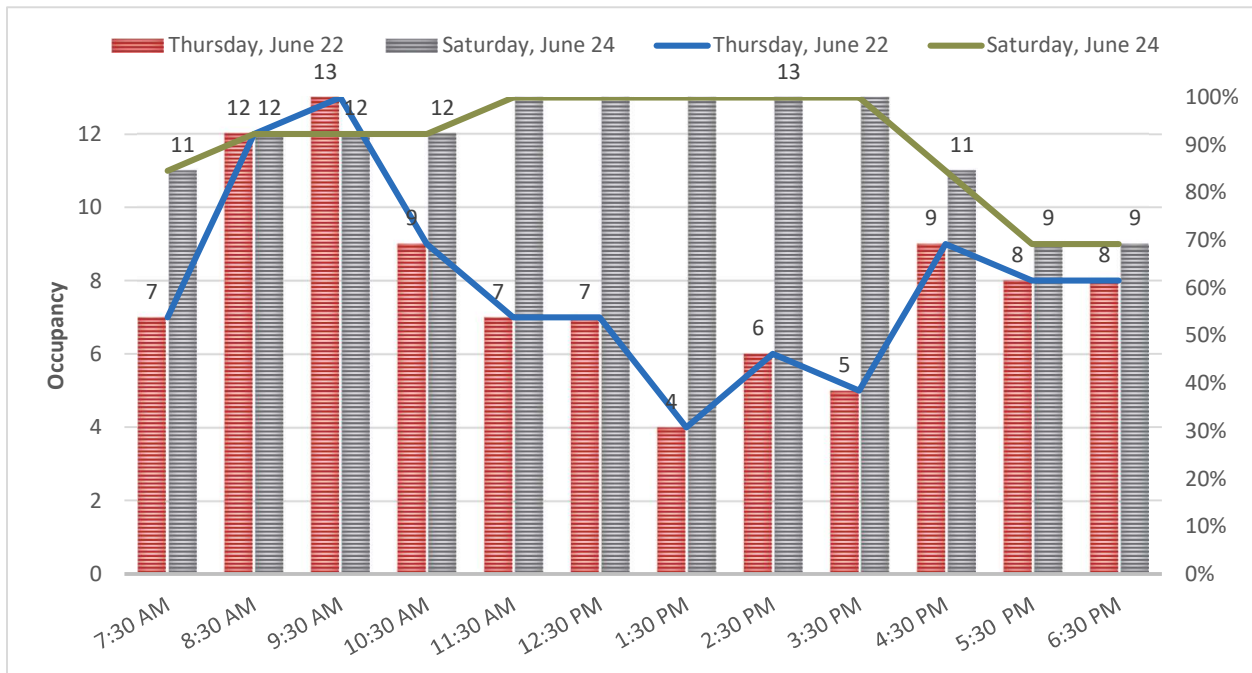


Figure 27 Alpine Trailhead Parking Lot Utilization and Occupancy – Summer 2023
 Source: Parametrix

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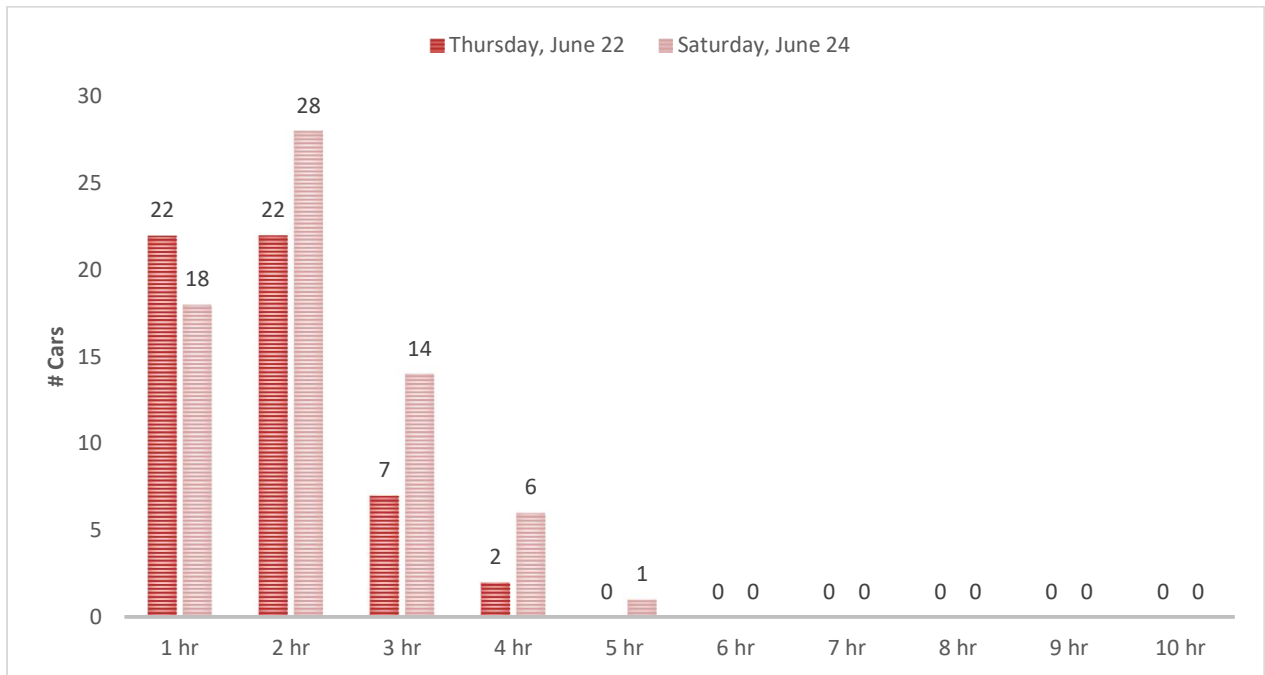


Figure 28 Alpine Trailhead Parking Lot Parking Duration – Summer 2023
 Source: Parametrix

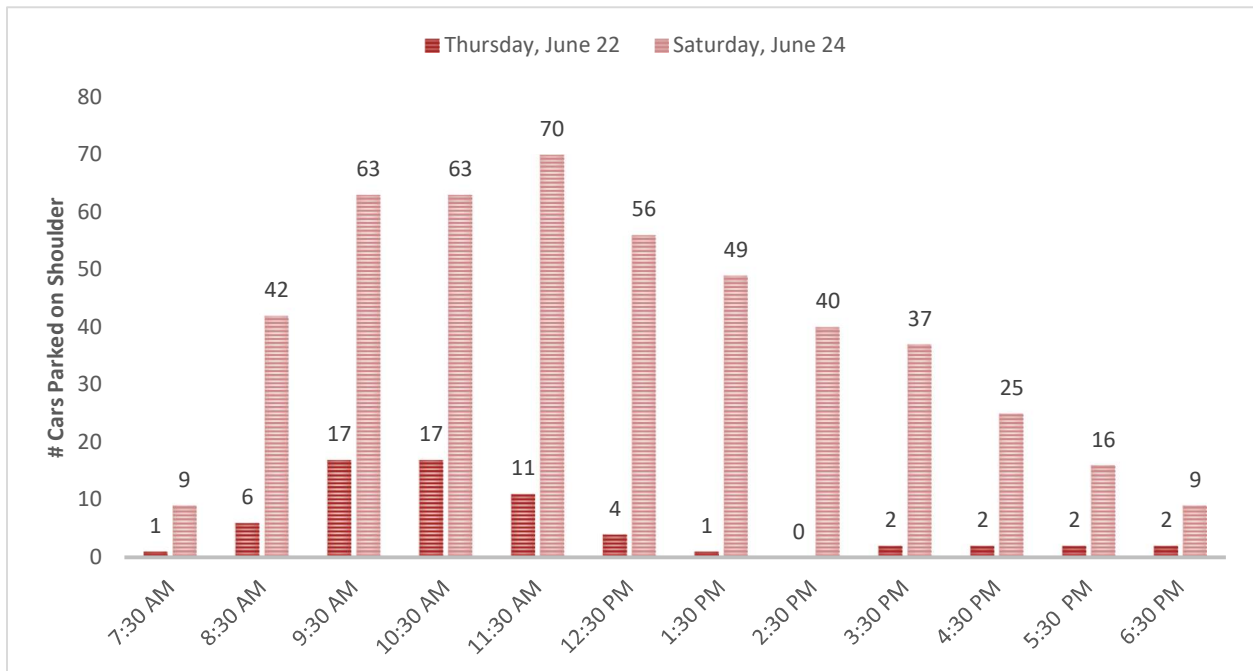


Figure 29 Alpine Trailhead Shoulder Parking, Alpine Road and Willowbrook Drive – Summer 2023
 Source: Parametrix

4.3 Anniversary Trail (Windy Hill Reserve)

The Anniversary Trailhead gravel parking lot has an estimated 12 parking spaces, a restroom and picnic tables and is accessed via State Route 35 / Skyline Boulevard (Figure 30).



Figure 30 Parking Lot at Anniversary Trail (Windy Hill Preserve)
Source: Google

4.3.1 Fall 2022

The parking lot had greater than 50% utilization for four hours on Saturday (Figure 31). The average parking duration was 1.9 hours on Thursday, October 20th and 1.6 hours on Saturday, October 22nd (Figure 32) Demand at the Anniversary trail tended to peak around noon on Thursday and tapered afterward. On Saturday, the parking demand was intermittently high into the evening hours.

4.3.2 Summer 2023

The parking lot had greater than 50% utilization for four hours on Saturday and three hours on Thursday (Figure 33). The average parking duration in May was 2.4 hours on Thursday, May 18th and 1.6 hours on Saturday, May 20th (Figure 34).

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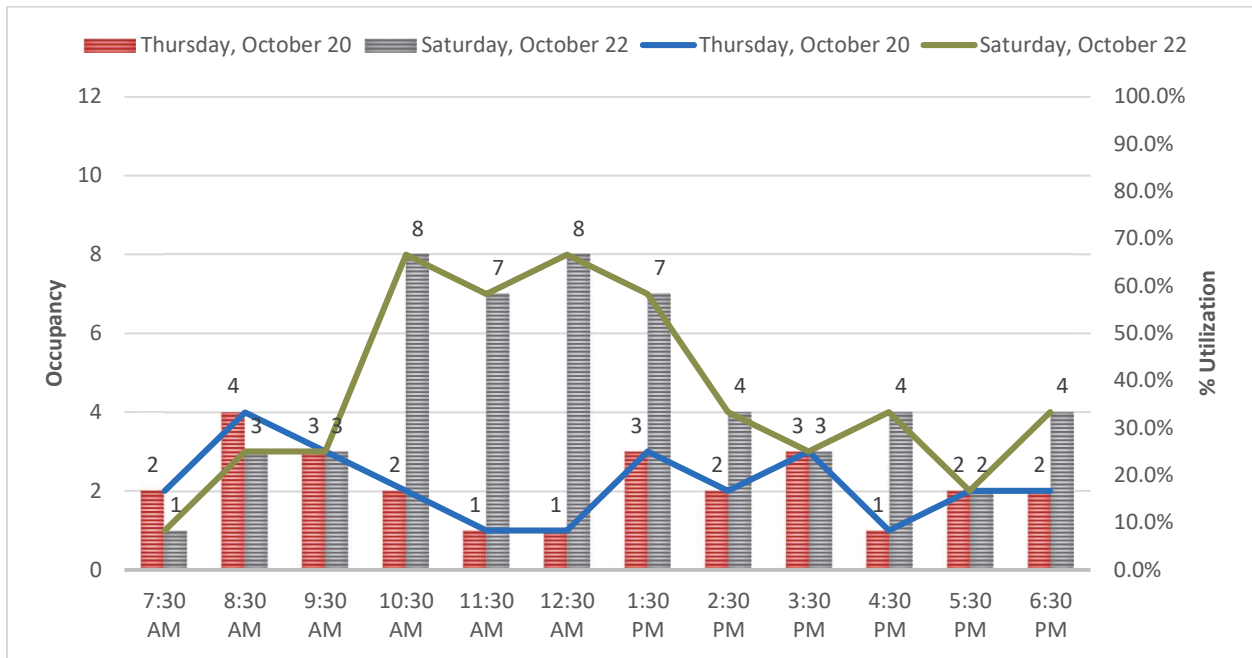


Figure 31 Anniversary Trail Parking Lot Utilization and Occupancy - Fall 2022
 Source: Mead & Hunt

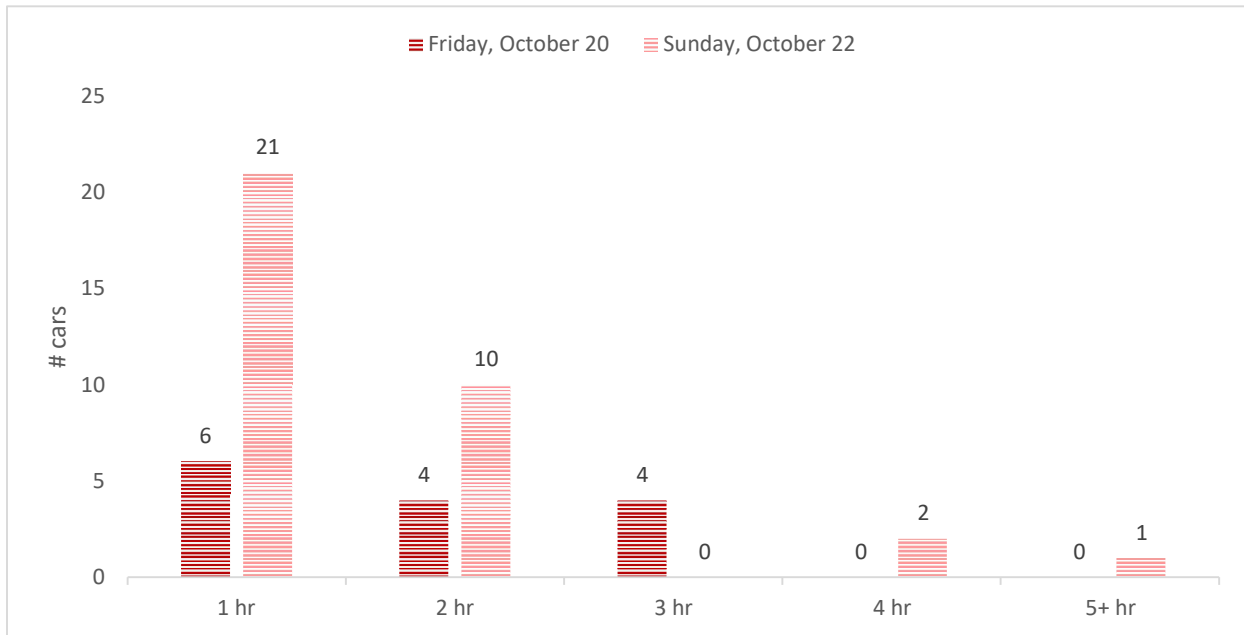


Figure 32 Anniversary Trail Parking Lot Parking Duration - Fall 2022
 Source: Mead & Hunt

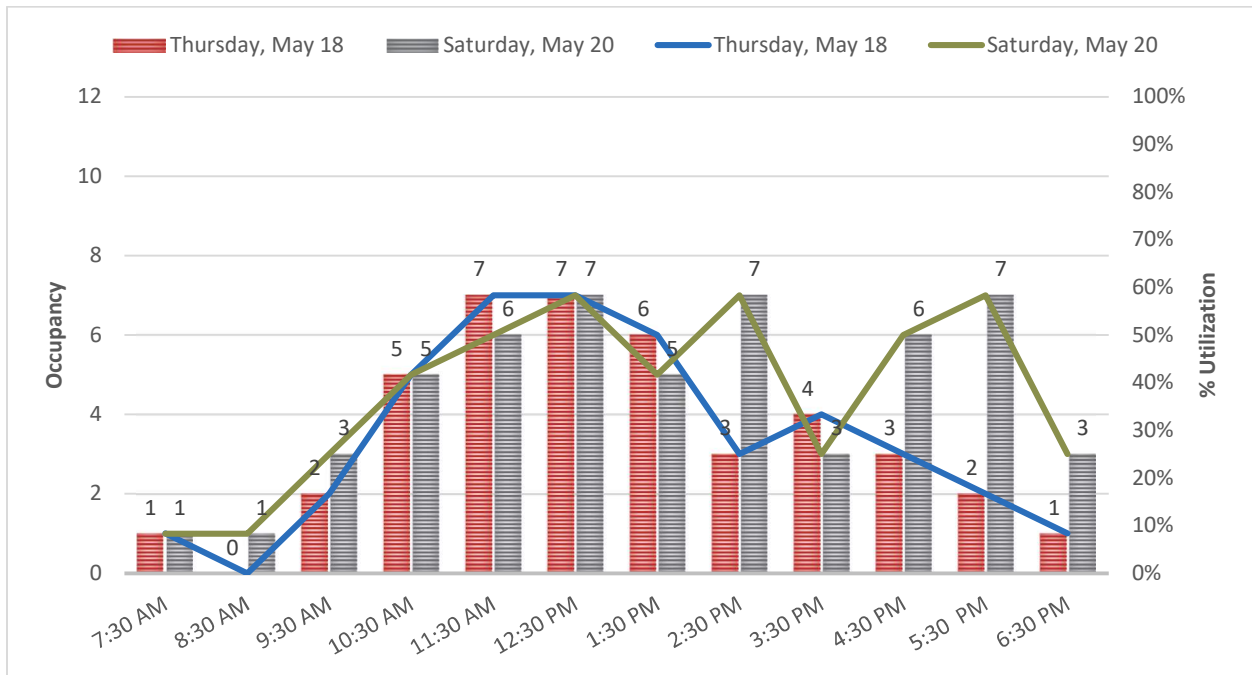


Figure 33 Anniversary Trail Parking Lot Utilization and Occupancy - Summer 2023
 Source: Parametrix

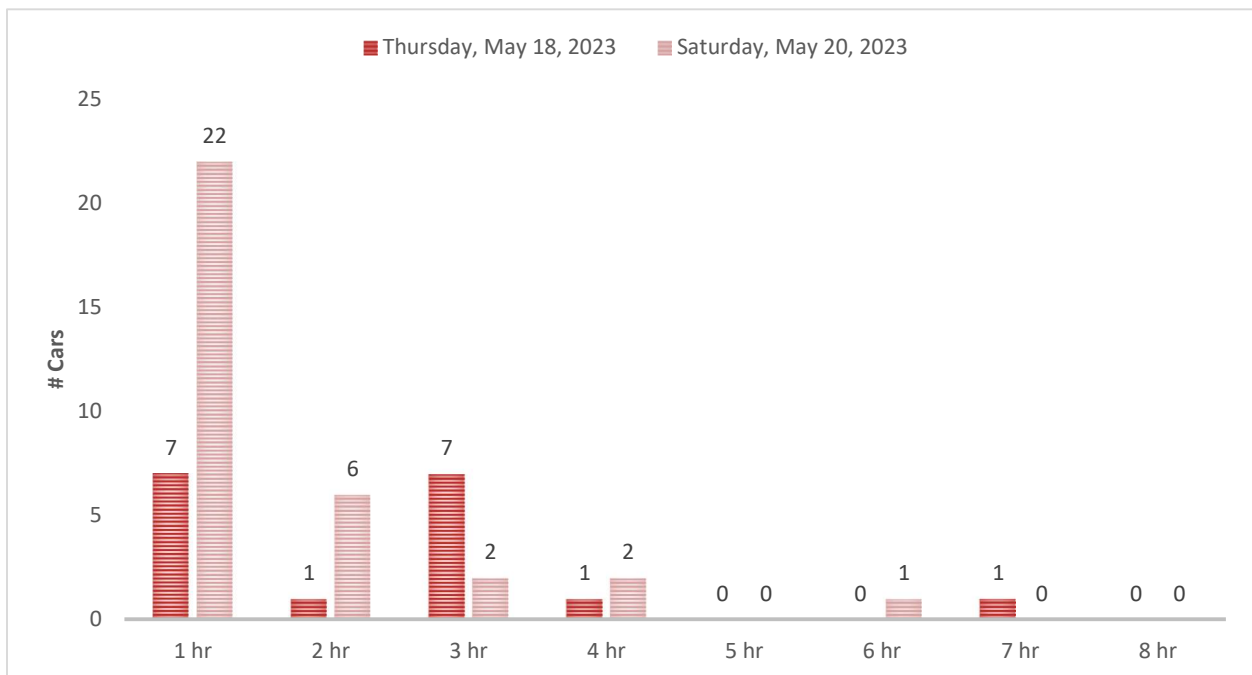


Figure 34 Anniversary Trail Parking Lot Parking Duration - Summer 2023
 Source: Parametrix

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4.4 Spring Ridge (Windy Hill Preserve)

The Spring Ridge gravel parking lot has an estimated 25 parking spaces (Figure 35). According to Midpen staff, Spring Ridge visitors tend to use this trailhead for short hikes and/or short duration views of the vista points, whereas more users of the “lower” Windy Hill trailheads use those areas for long hikes to the top of Windy Hill.



Figure 35 Parking Lot at Spring Ridge (Windy Hill Preserve)
Source: Google

4.4.1 Fall 2022

The parking lot did not exceed 50% occupancy on either sampled Thursday or Saturday in October (Figure 36). The average duration was 1 hour on Thursday, October 20th and 1.4 hours on Saturday, October 22nd (Figure 37).

4.4.2 Summer 2023

The parking lot had greater than 50% utilization for one hour on Saturday (Figure 38). The average duration was 1.2 hours on Thursday, May 18th and 1.3 hours on Saturday, May 20th (Figure 39). Demand on Thursday was relatively low throughout the day and high for only one hour on Saturday.

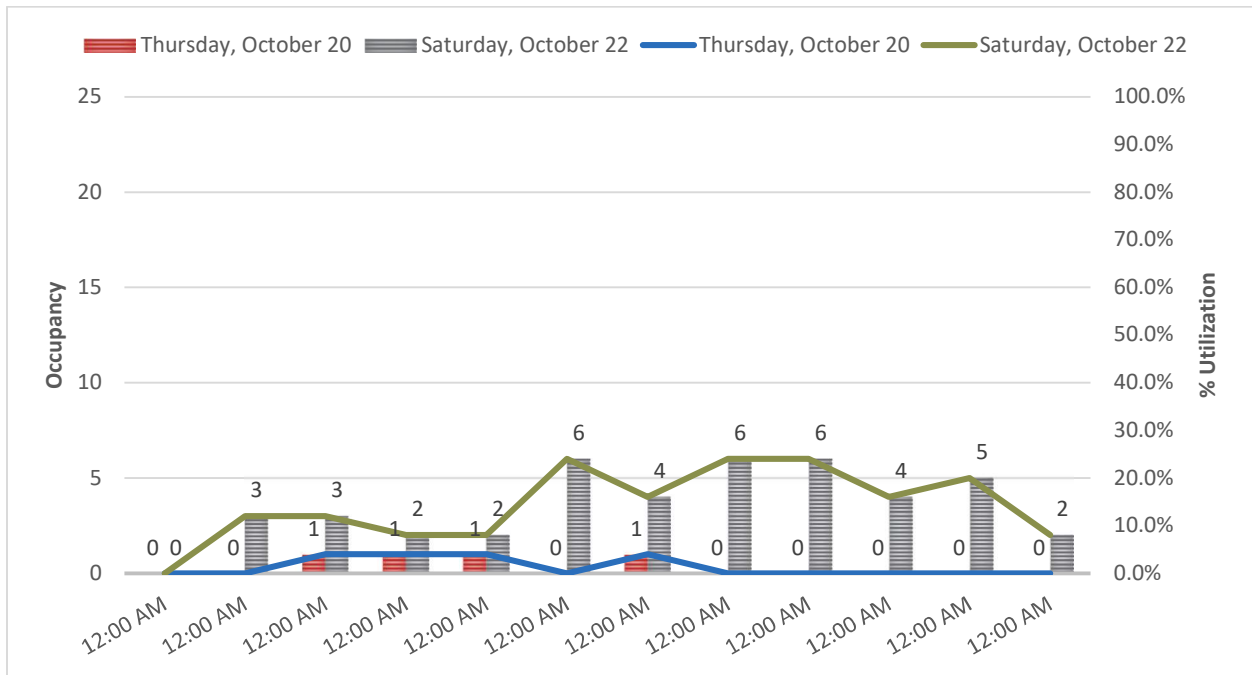


Figure 36 Spring Ridge Parking Lot Utilization and Occupancy- Fall 2022
 Source: Mead & Hunt

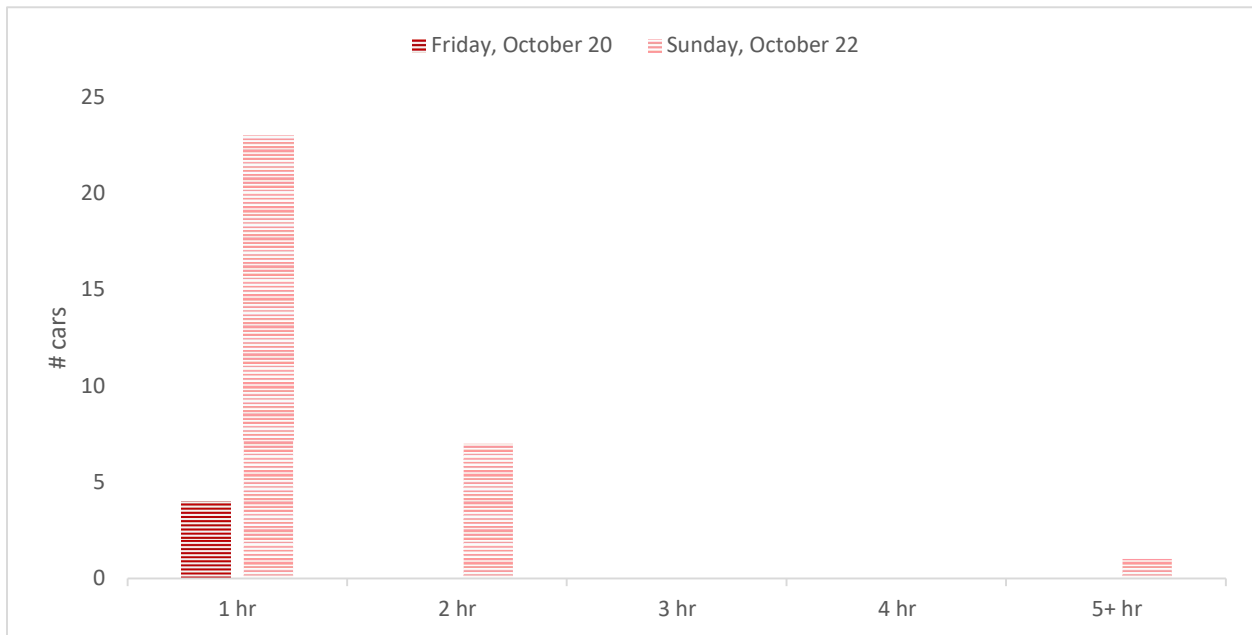


Figure 37 Spring Ridge Parking Lot Parking Duration - Fall 2022
 Source: Mead & Hunt

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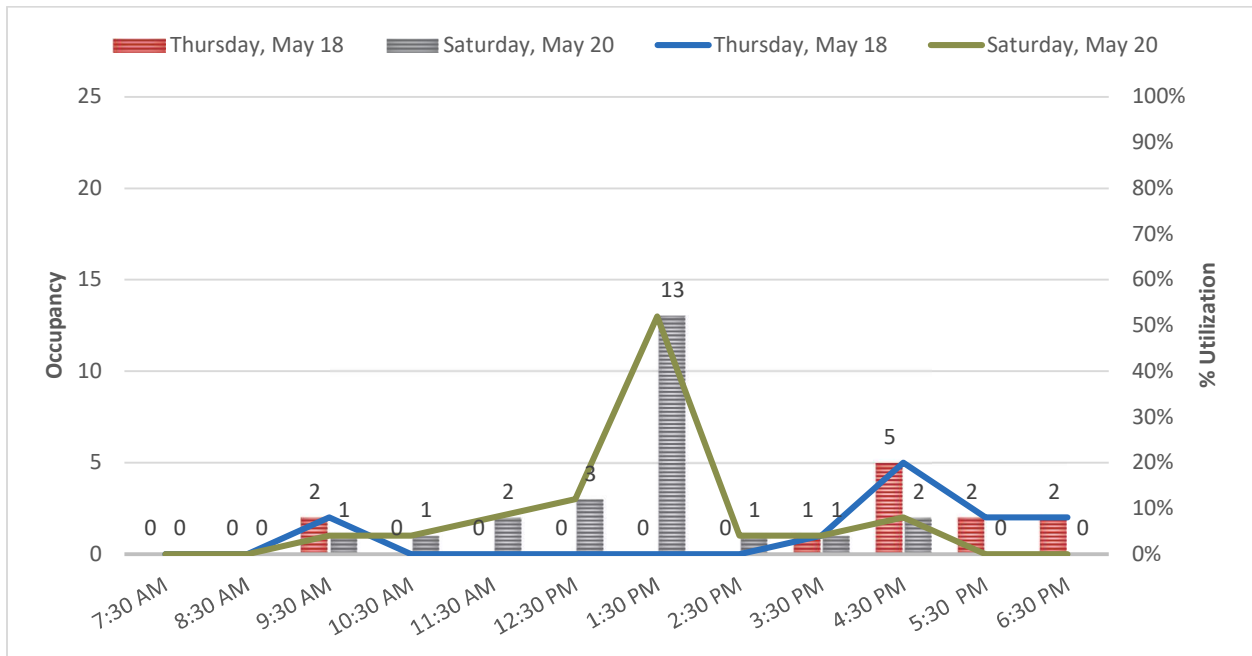


Figure 38 Spring Ridge Parking Lot Utilization and Occupancy - Summer 2023
 Source: Parametrix

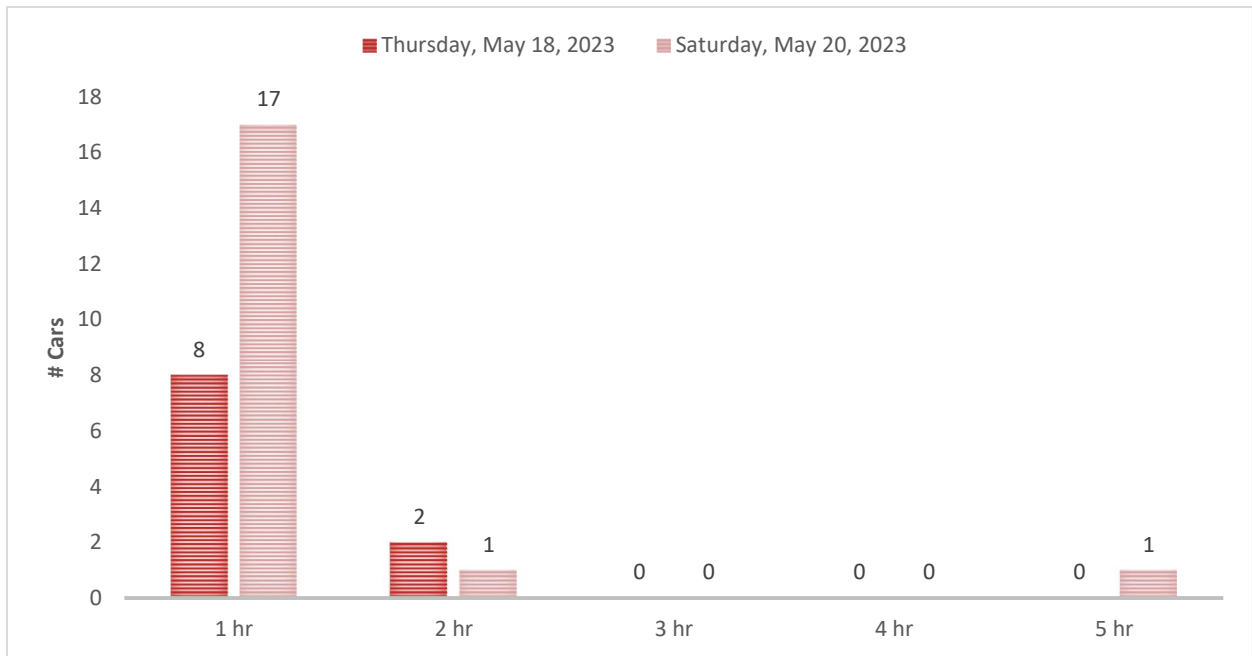


Figure 39 Spring Ridge Parking Lot Parking Duration - Summer 2023
 Source: Parametrix

4.5 Thornewood Parking Area

The Thornewood main parking lot has an estimated 11 parking spaces and two accessible parking spaces (Figure 40). Access is through Espinosa Road to the parking lot.

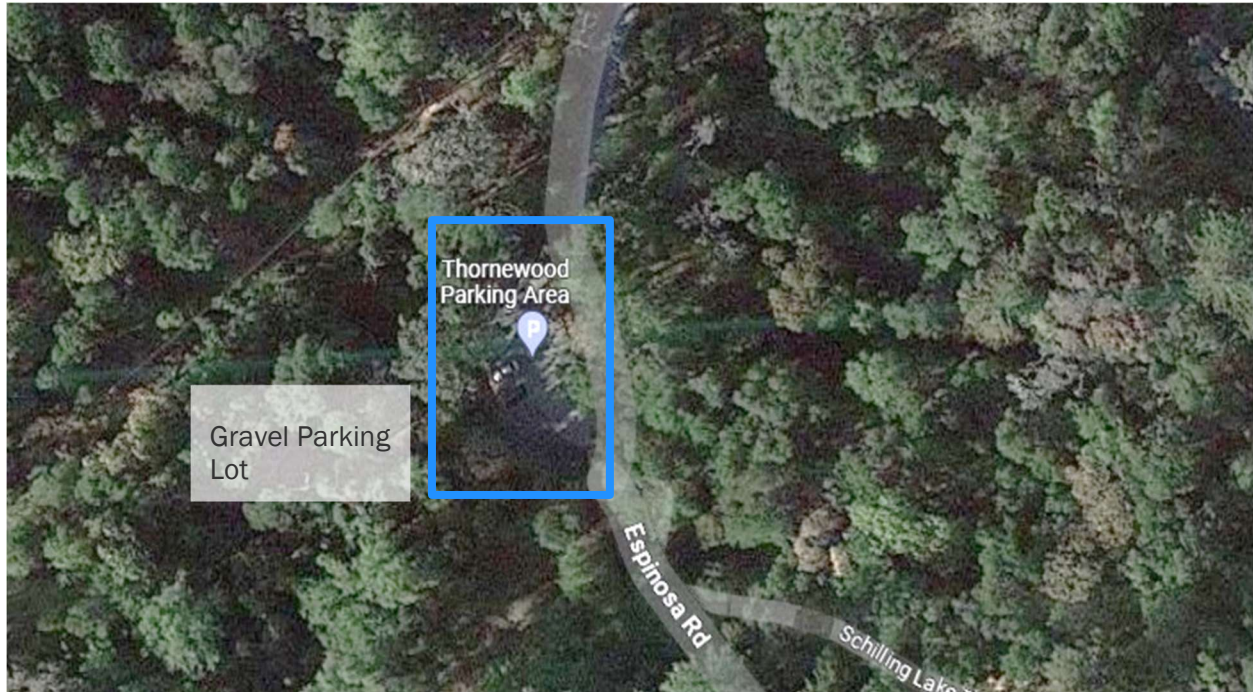


Figure 40 Parking Lot at Thornewood Parking Area (Thornewood Preserve)
Source: Google

4.5.1 Fall 2022

Thornewood parking demand exceeded 50% occupancy for two hours on Saturday (Figure 41). The sampled Thursday parking demand did not exceed two parked cars. The average duration was 1.5 hours on Thursday and 1.4 hours on Saturday (Figure 42).

4.5.2 Summer 2023

Thornewood parking demand did not meet 50% occupancy on Thursday or Saturday (Figure 43). On Saturday, a temporary “ROAD CLOSED” sign was posted on Highway 35 at Highway 84 (towards Thornewood Preserve) between about 9am and 3pm due to Caltrans crews working on the roadway shoulder; this may have deterred visitors from visiting Thornewood. The average duration was 2 hours on Thursday, May 18th and 1.5 hours on Saturday, May 20th (Figure 44).

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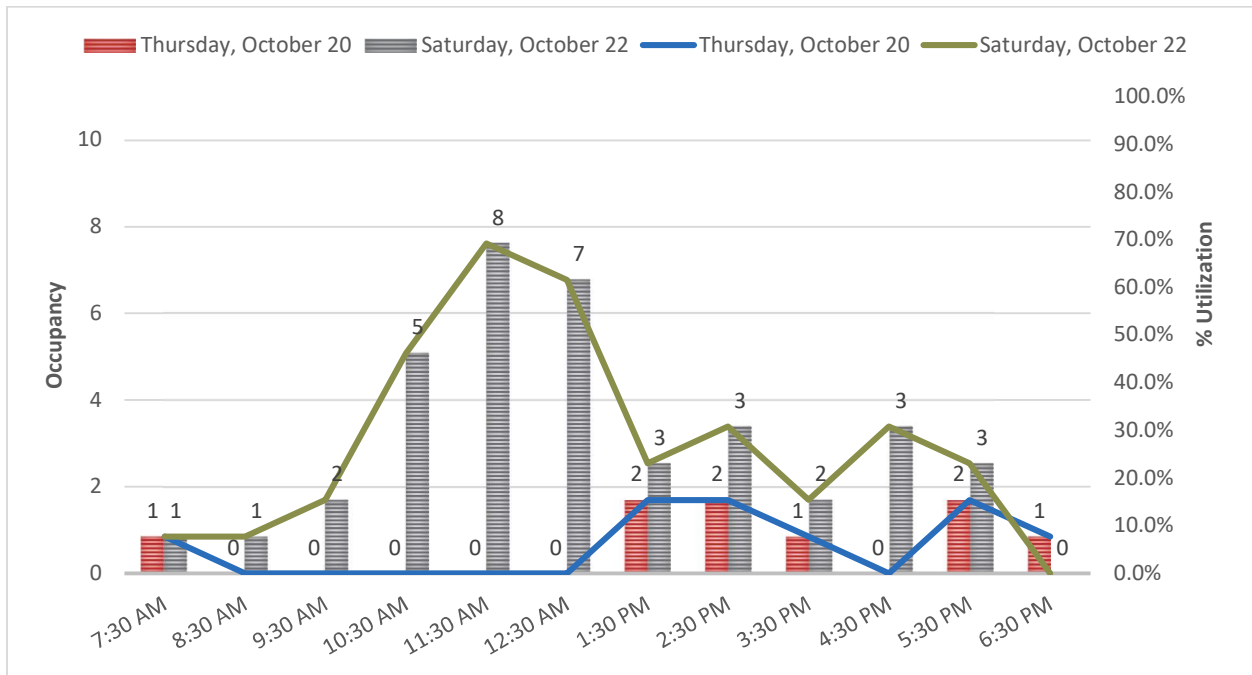


Figure 41 Thornewood Parking Lot Utilization and Occupancy - Fall 2022
 Source: Mead & Hunt

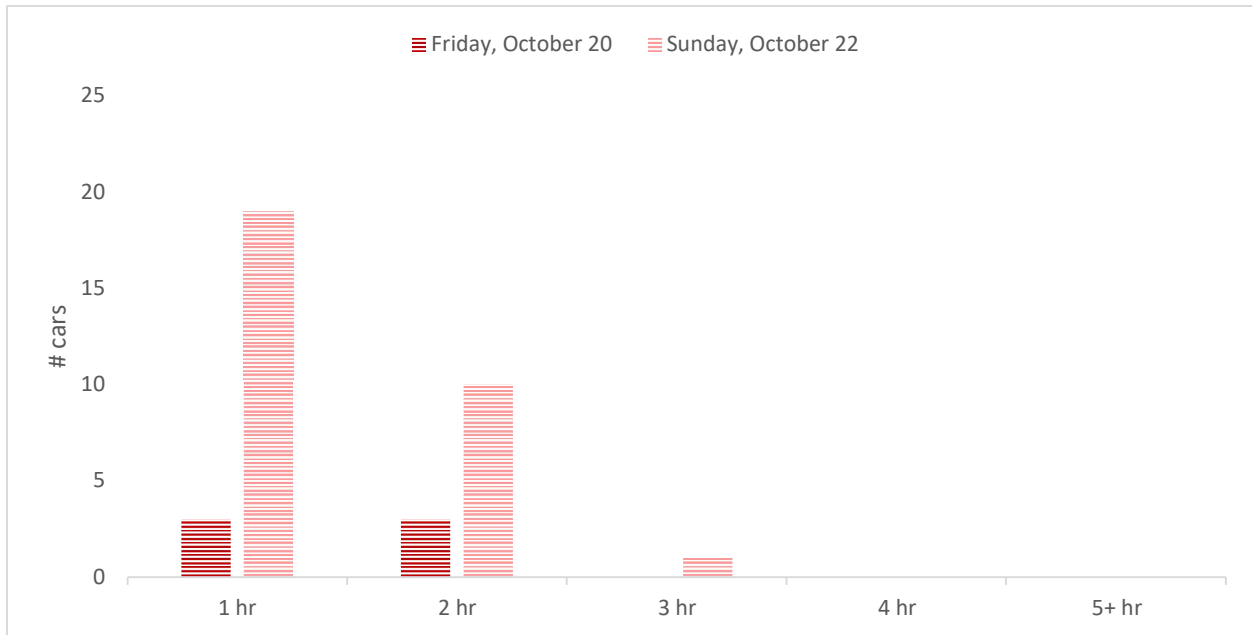


Figure 42 Thornewood Parking Lot Parking Duration - Fall 2022
 Source: Mead & Hunt

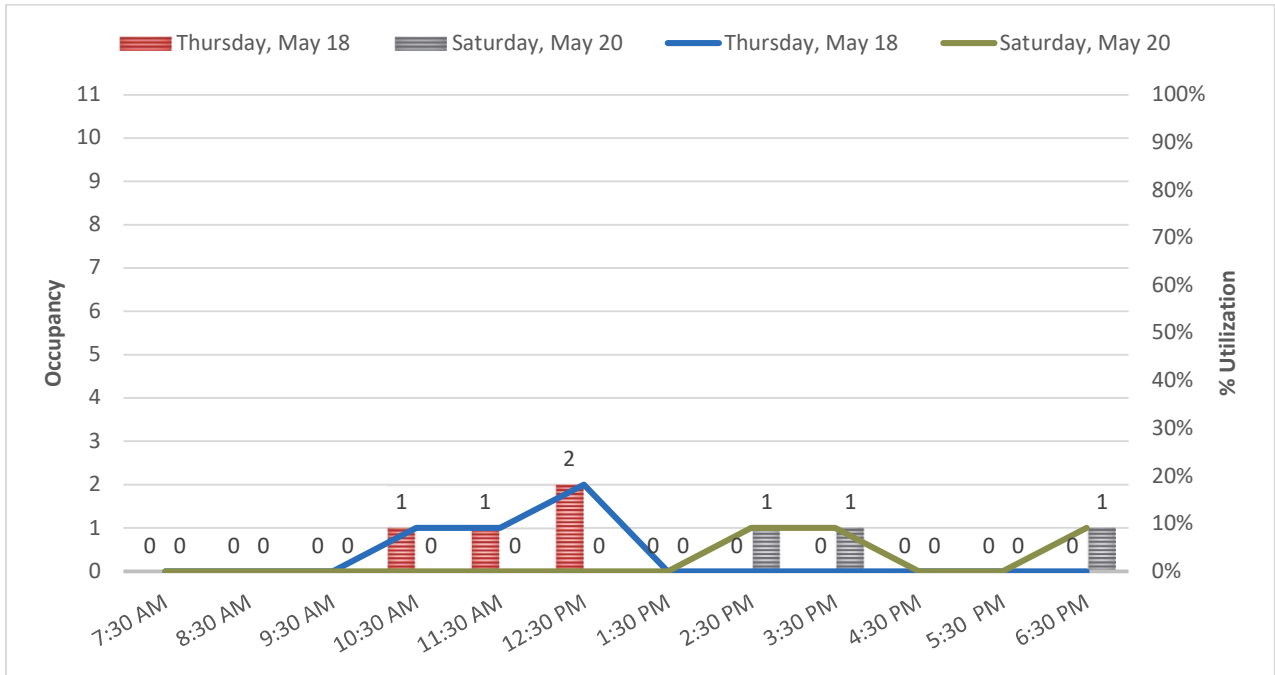


Figure 43 Thornewood Parking Lot Utilization and Occupancy - Summer 2023
 Source: Parametrix

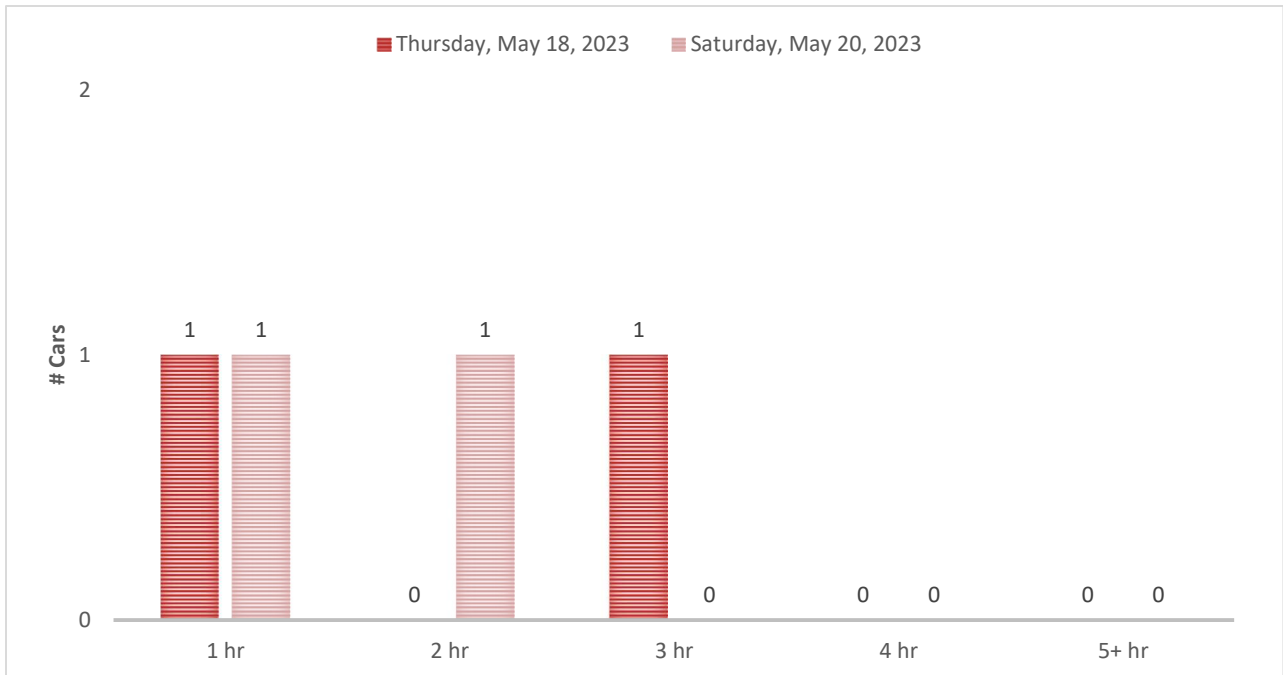


Figure 44 Thornewood Parking Lot Parking Duration - Summer 2023
 Source: Parametrix

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4.6 Bridle Trailhead (Thornewood Preserve)

The Bridle Trailhead gravel parking lot has an estimated 10 parking spaces and is accessed from Old La Honda Road (Figure 45).

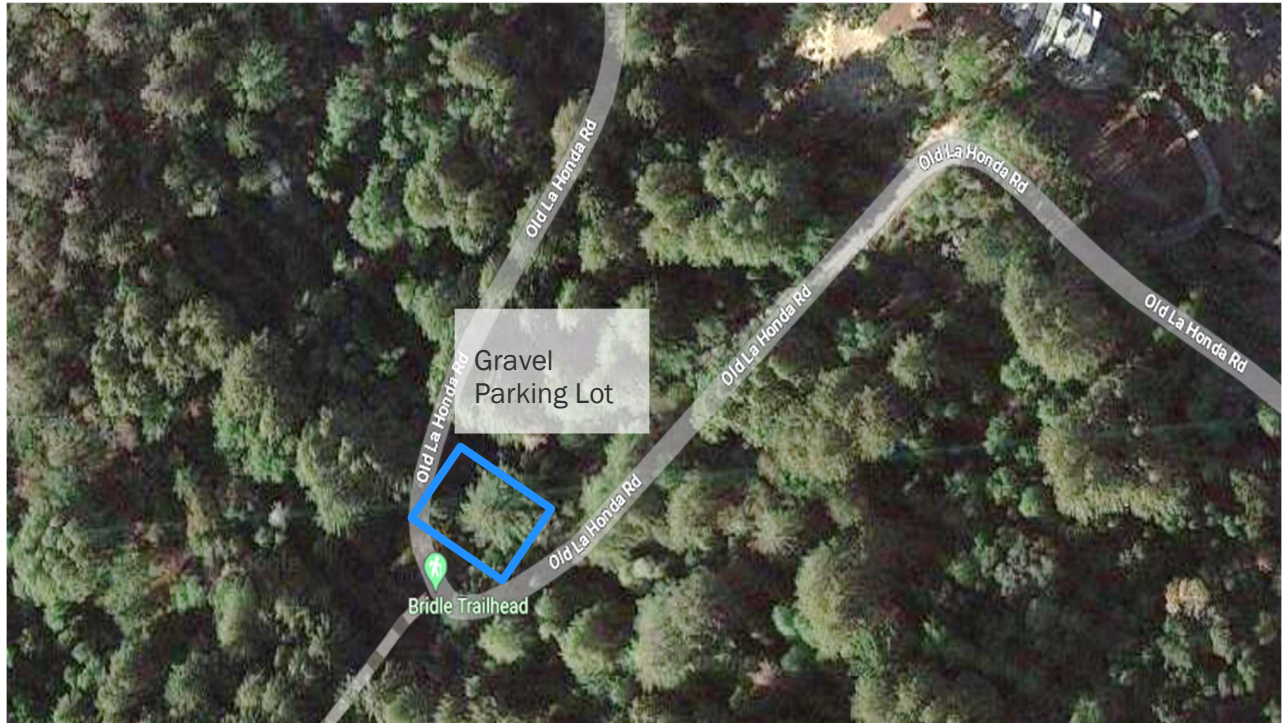


Figure 45 Parking Lot at Bridle Trailhead (Thornewood Preserve)
Source: Google

4.6.1 Fall 2022

The parking lot had greater than 50% utilization for eight hours on Saturday (Figure 46). The average duration was 1.2 hours on Thursday and 1.4 hours on Saturday (Figure 47). Parking demand for Thursday was highest around 9:30am and tapered down after 10:30am before picking up at 4:30pm. Parking demand for Saturday peaked at 1:30pm but was relatively high between 9:30am and 5:30pm.

4.6.2 Summer 2023

The parking lot had greater than 50% utilization for seven hours on Saturday and greater than 50% utilization for two hours on Thursday (Figure 47). The average duration was 1.7 hours on Thursday, May 18th and 1.5 hours on Saturday, May 20th (Figure 48) Parking demand for Thursday was highest around 9:30am and tapered down after 10:30am. Parking demand for Saturday peaked in the morning around 10:30am and again at around 3:30pm.

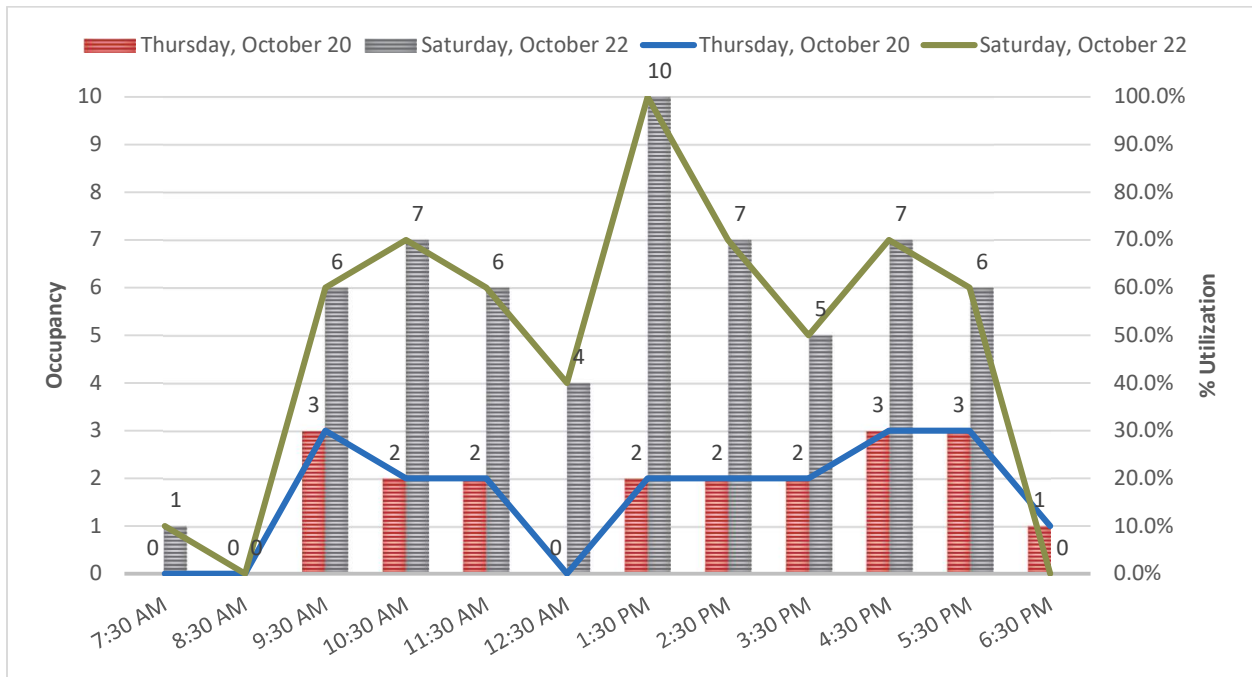


Figure 46 Bridle Trailhead Parking Lot Utilization and Occupancy – Fall 2022
 Source: Mead & Hunt

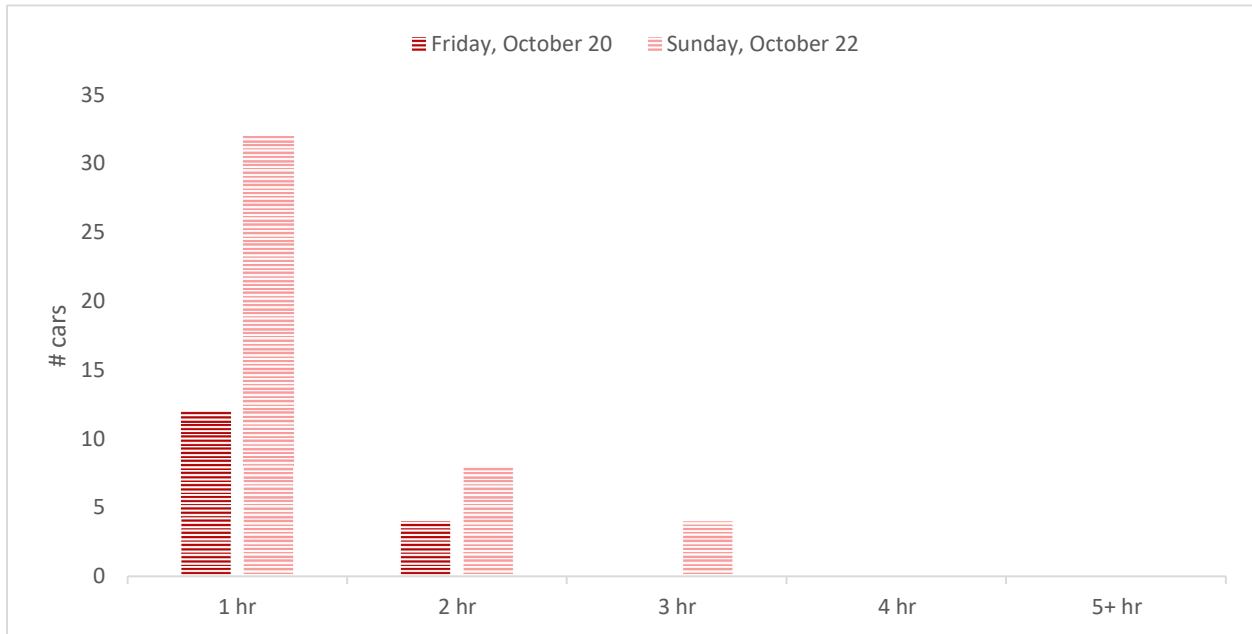


Figure 47 Bridle Trailhead Parking Lot Parking Duration – Fall 2022
 Source: Mead & Hunt

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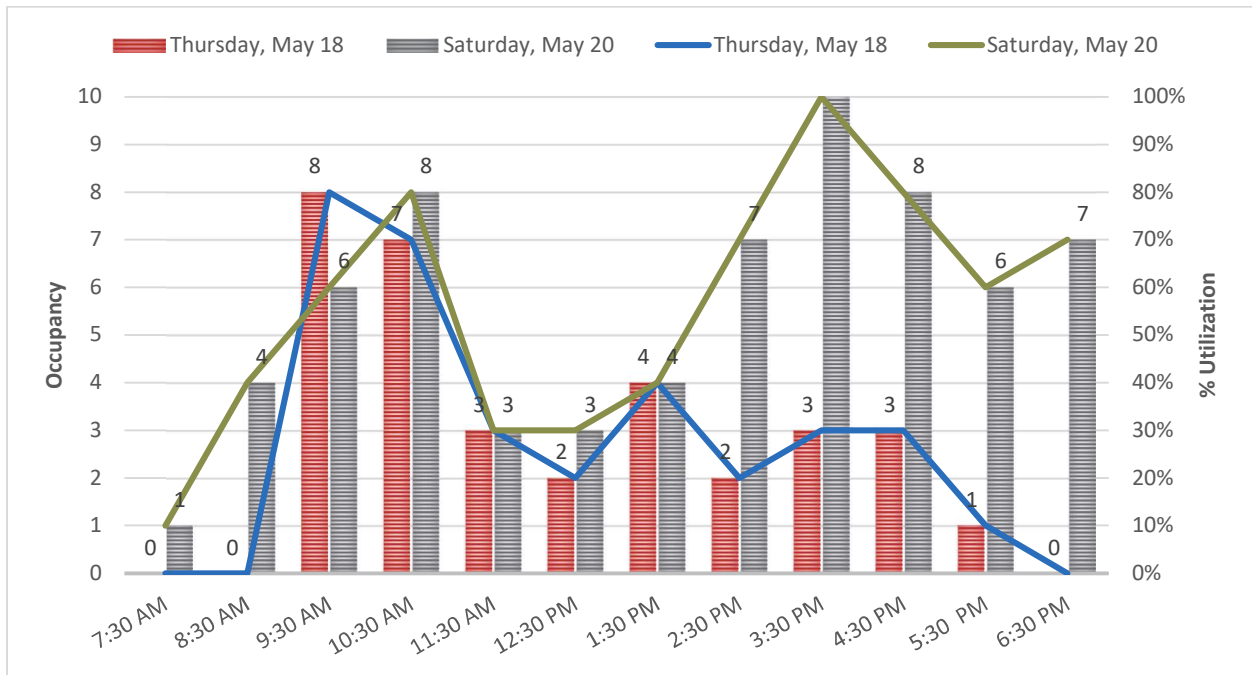


Figure 48 Bridle Trailhead Parking Lot Utilization and Occupancy - Summer 2023
 Source: Parametrix

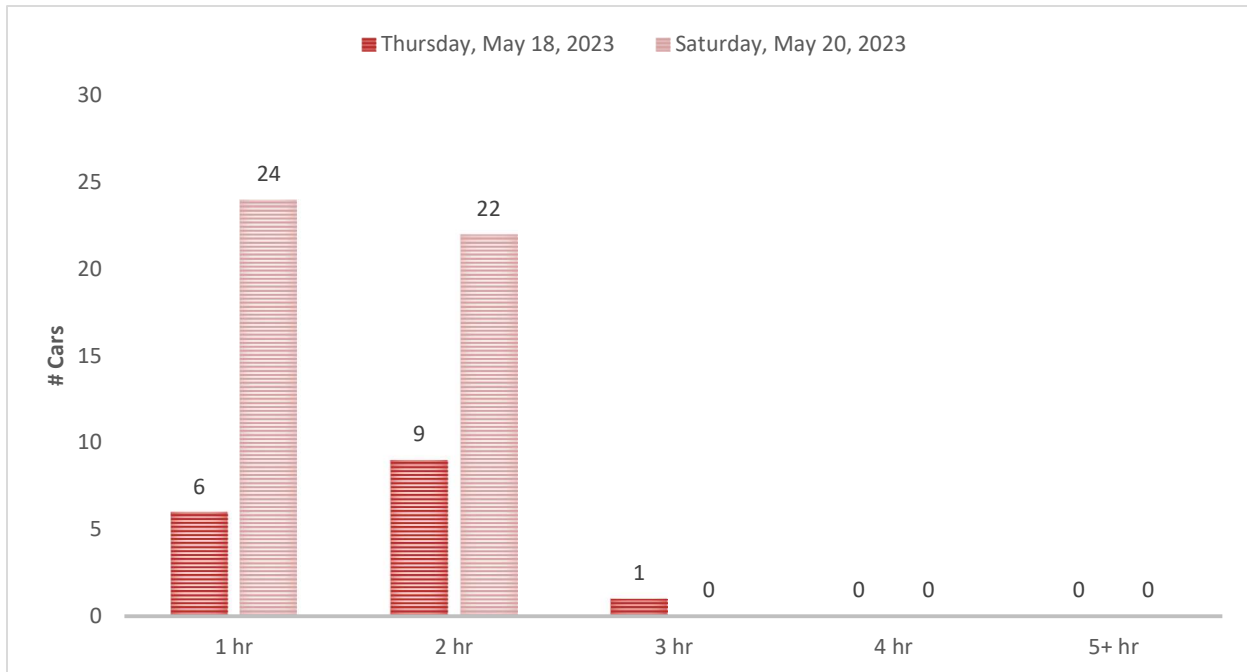


Figure 49 Bridle Trailhead Parking Lot Parking Duration - Summer 2023
 Source: Parametrix

4.7 Roberts Market

The Roberts Market lot has 100 parking spaces, with 54 spaces (including four accessible spaces) on the front and sides of the building typically used by customers (Figure 50, Areas A-C and F) and the rear lot reserved for market and shopping center employees (Areas D and E) as confirmed by Roberts Market store managers. The Roberts Market location was not counted in October 2022 but was included in the summer 2023 data collection work based on feedback received by Midpen during their Hawthorns Area Plan project’s public engagement efforts.

The paved parking lot had an average parking duration of 1.3 hours on Thursday, May 18th and 1.4 hours on Saturday, May 20th (Figure 52) Between 90 and 93 percent of the observed vehicles stayed for one hour or less (Figure 52). Some portion of customers arriving and departing between the hourly observations would not have been counted; these customers would lower the average occupancy. The several cars staying for multiple hours may have been market employees.

The only time the parking lot exceeded 50% occupancy was around noon on Saturday (Figure 51). The peak hour of demand at this lot occurs near the end of peak demand at the Lower Windy Hill parking lot (Figure 18) and in the middle of the Alpine Trail parking lot peak utilization time (Figure 27).

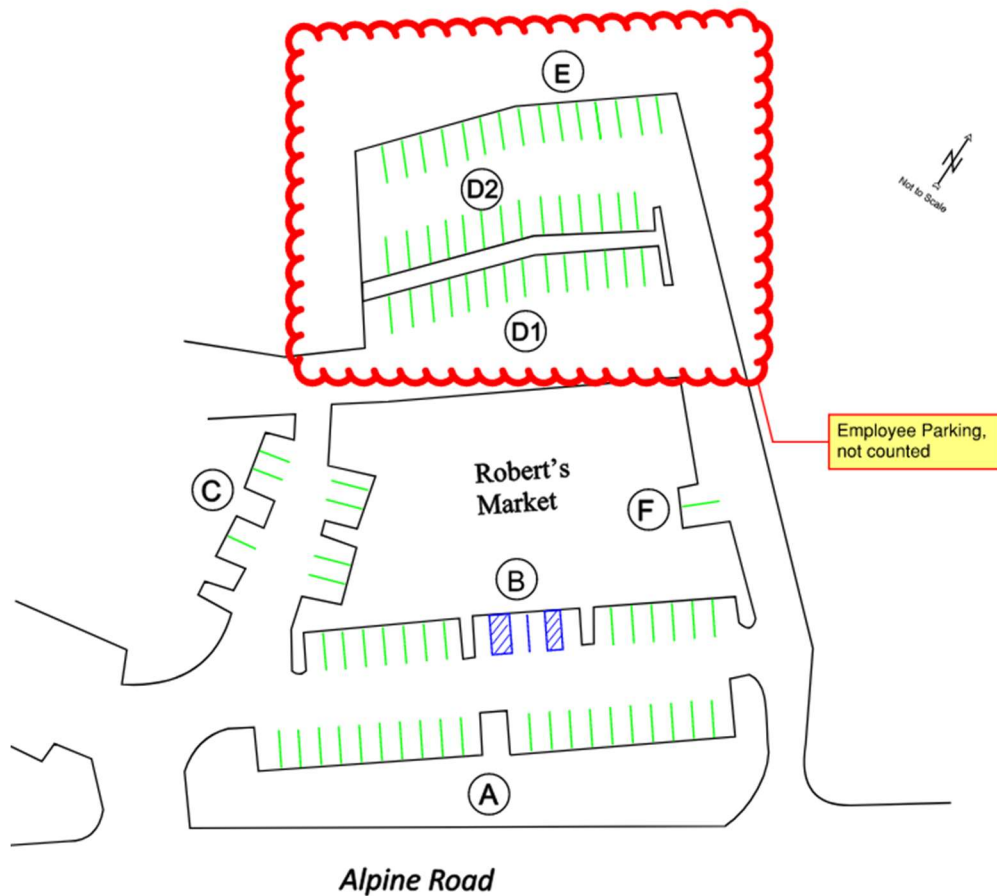


Figure 50 Roberts Market Parking Lot Layout Diagram
 Source: Traffic Counts Plus, 2023

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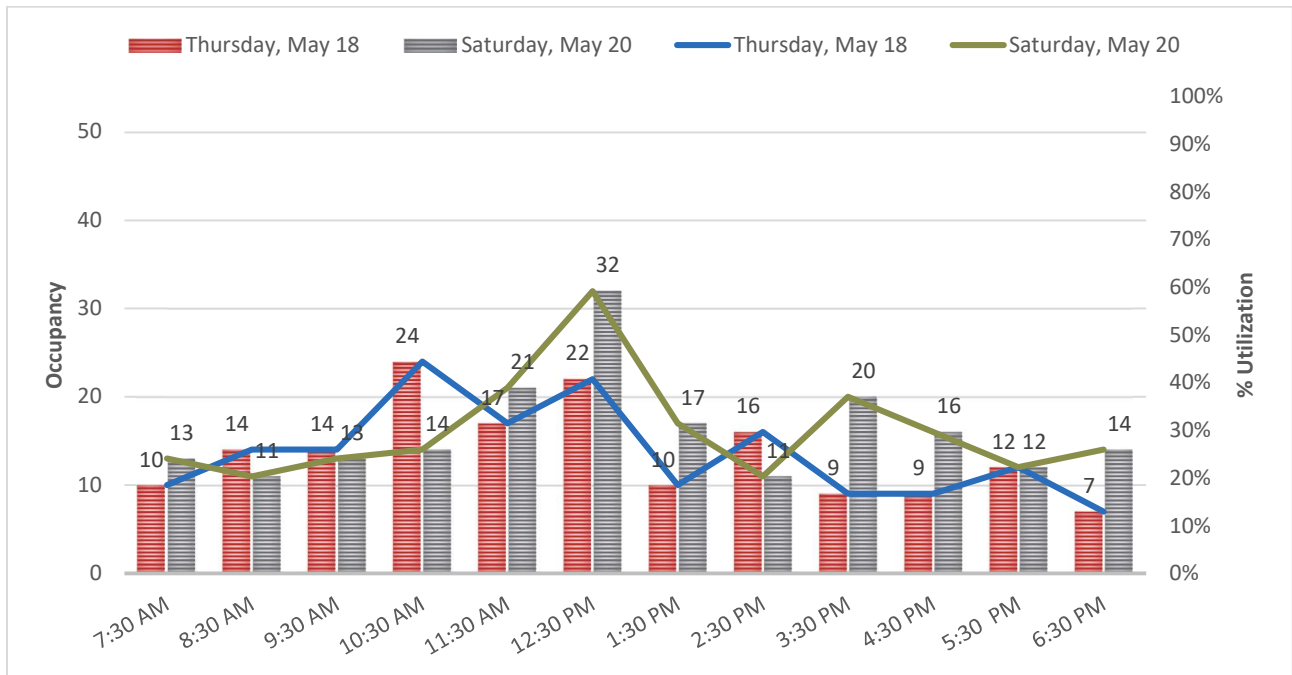


Figure 51 Roberts Market Parking Lot Utilization and Occupancy – Summer 2023
 Source: Parametrix

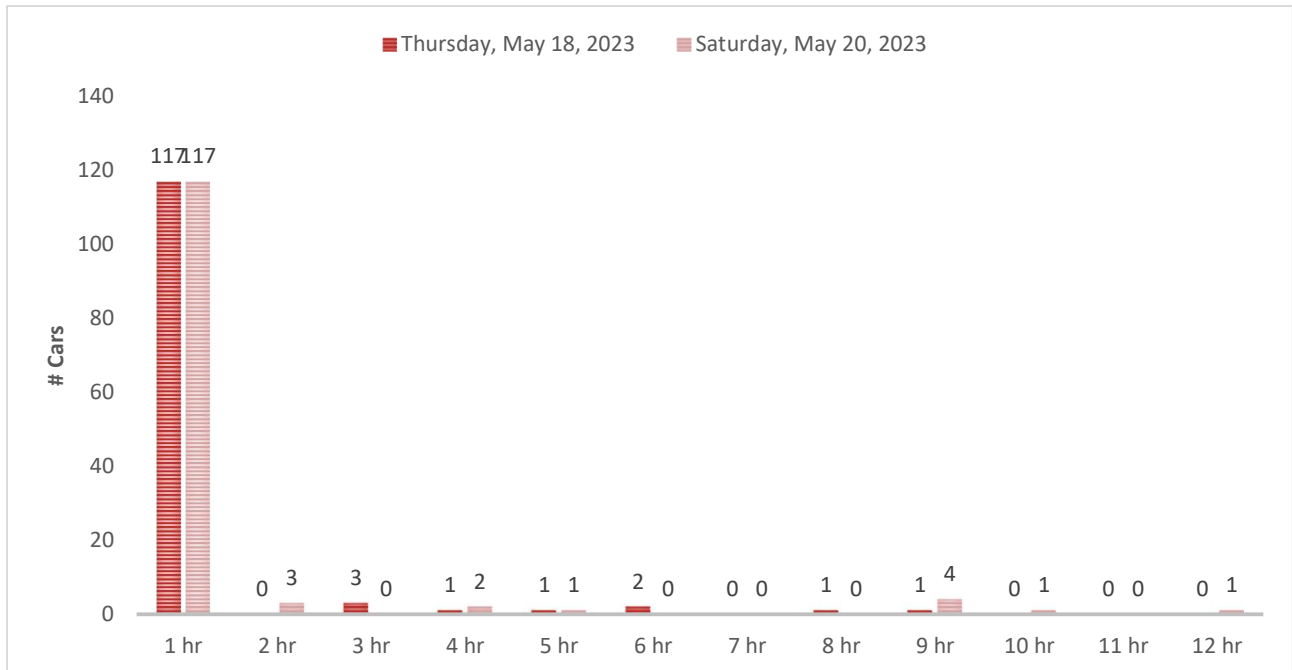


Figure 52 Roberts Market Parking Lot Parking Duration – Summer 2023
 Source: Parametrix

4.8 Portola Valley Town Center Parking

Additional data were collected in June 2023 at the Portola Valley Town Center, which is an overflow parking lot for the Windy Hill lot. There was a farmers’ market on Thursday, June 22 for which 18 paved stalls were blocked off. Parking in this lot on Saturday, the peak demand day for trailhead parking, was less than the parking demand on Thursday.

Table 10 Portola Valley Town Center Parking Occupancy Thursday, June 22nd, 2023

| Supply | Portola Valley - Main Lot | | Portola Valley - Additional Lot | |
|--------|---------------------------|--------------|---------------------------------|--------------|
| | Paved | Off Pavement | Paved | Off Pavement |
| | 29 | ≈ 13 | 46 | ≈ 18 |
| 7:30 | 9 | 2 | 3 | 0 |
| 8:30 | 11 | 2 | 18 | 1 |
| 9:30 | 18 | 2 | 13 | 0 |
| 10:30 | 25 | 3 | 12 | 0 |
| 11:30 | 22 | 4 | 9 | 0 |
| 12:30 | 20 | 2 | 9 | 0 |
| 1:30 | 20 | 5 | 9 | 0 |
| 2:30 | 22 | 11 | 22 | 11 |
| 3:30 | 27 | 13 | 22 | 18 |
| 4:30 | 27 | 13 | 21 | 18 |
| 5:30 | 11 | 7 | 15 | 16 |
| 6:30 | 6 | 5 | 9 | 5 |

Source: Parametrix

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Table 11 Portola Valley Town Center Parking Occupancy Saturday, June 24th, 2023

| Supply | Portola Valley - Main Lot | | Portola Valley - Additional Lot | |
|--------|---------------------------|--------------|---------------------------------|--------------|
| | Paved | Off Pavement | Paved | Off Pavement |
| | 29 | ≈ 13 | 46 | ≈ 18 |
| 7:30 | 1 | 2 | 0 | 0 |
| 8:30 | 11 | 2 | 6 | 0 |
| 9:30 | 14 | 3 | 19 | 0 |
| 10:30 | 17 | 3 | 26 | 0 |
| 11:30 | 15 | 2 | 16 | 0 |
| 12:30 | 18 | 3 | 7 | 0 |
| 1:30 | 16 | 5 | 12 | 0 |
| 2:30 | 15 | 5 | 10 | 0 |
| 3:30 | 9 | 5 | 5 | 0 |
| 4:30 | 13 | 5 | 11 | 0 |
| 5:30 | 9 | 3 | 13 | 0 |
| 6:30 | 5 | 2 | 5 | 0 |

Source: Parametrix

5. Hawthorns Area Parking Demand Analysis

This parking demand analysis is based on various sources of data collected as part of this project. This data includes: existing parking lot utilization at entrances to the Windy Hill and Thornewood preserves; transportation mode share and trends collected from big-data sources prior to and following the COVID pandemic; responses to a public survey; and review of industry publications on parking demand.

5.1 Parking Generation

A very common practice when estimating parking demand is to utilize the Institute of Transportation Engineer's Trip and Parking Generation Manual. This publication contains data from previously performed parking surveys and categorizes it based on the type of destination. The current version of this publication (11th Edition) does not have a category for open space preserve, but it has a category for a Public Park (Land Use Code: 411). However, the data sample size for this category is small and has a large range (0.17 – 5.08 vehicles/acre). Therefore, it was decided that this would not be a reliable method of estimating parking demand at the Hawthorns Area. Instead, the data that was collected locally would be a better starting point for the parking demand calculations.

The entrance to the Hawthorns Area will most likely be situated along Alpine Road and, as such, be in close proximity to the Windy Hill Open Space Preserve entrances along Portola Road (main parking lot) and the Alpine Road Trailhead. It is assumed that, although the Hawthorns Area is much smaller than Windy Hill, with a regionally connected trail network, the recreation options will be similar to what is offered at Windy Hill. This assumption would cover the conditions that would generate the highest demand at the Hawthorns Area. It is further assumed that the time for peak visitation demand at the Hawthorns Area will be consistent with the peak demand time observed Windy Hill. This was observed to be mid-day on weekends. The observed parking demand at the Windy Hill main entrance and Alpine Road trailhead are therefore used as the starting point for the Hawthorns Area parking demand. This demand was observed during two separate times and is summarized in Table 12 below.

Table 12 Windy Hill Observed Peak Parking Demand (Weekend Mid-day)

| Preserve Entrance | Oct. 2022 | May 2023 |
|---|-----------|----------|
| Windy Hill Main Parking Lot | 60 | 42 |
| Alpine Road (including Willowbrook Drive) | 51 | 72 |
| Total | 111 | 114 |

Source: Mead & Hunt, 2023.

It is assumed that the trails in the Hawthorns Area will be connected regionally to other trails. This will allow for longer hikes like what is currently possible at Windy Hill. For a highest use scenario, this analysis assumes that other recreational uses (biking, dog walking, equestrian etc.) will be similar to that of Windy Hill and thus no change to the peak parking demand would be expected due to the recreational opportunities that exist at both locations. Therefore, the peak parking demand observed at Windy Hill (114) will be the starting point for estimating the peak parking demand at the Hawthorns Area. However, as described below, a number of factors will decrease or increase demand.

Pedestrian access to the main entrance of Windy Hill is very limited and therefore it is assumed that there is not a significant amount of visitor demand beyond what was observed during the parking

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utilization data collection. On the other hand, during the public survey, about 37% responded that they would walk or bike to access the Hawthorns Area. That difference in mode split will reduce the amount of vehicle parking demand for Hawthorns from 114 to 72.

The addition of the Hawthorns Area will increase the amount of open space accessible to the public. This increase in supply could induce additional total peak use demand in the area. This is supported by the fact that capacity at the Alpine Road entrance is exceeded during peak visitation times and potential visitors could be deterred. The lack of parking was also the primary complaint received from survey respondents. Based on observations of overflow parking at Windy Hill, this increase in total peak use demand stemming from the addition of the Hawthorns Area and associated parking lot is assumed to be in the range of 15-35% and results in a peak demand of 83-97.

However, that total demand is now also distributed between both Windy Hill and the Hawthorns Area. It is assumed that the Hawthorns Area will attract between 30-70% of the overall visitors. The remainder is assumed to visit Windy Hill. That results in a reduction of the peak demand at the Hawthorns Area to a range of 25-68. These calculations steps are summarized in Table 13 below.

Table 13 Windy Hill Observed Peak Parking Demand (Weekend Midday)

| Parking Demand Factor | Impact on Parking Demand | Park Parking Demand |
|---|--------------------------|---------------------|
| Existing Windy Hill Peak Parking Demand: | N/A | 114 |
| Greater number of visitors arriving by foot or bicycle at Hawthorns Area: | -37% | 72 |
| Increased visitation demand due to opening of Hawthorns Area: | (+15% to +35%) | 83-97 |
| Some people will still elect to visit Windy Hill: | (-70% to -30%) | 25-68 |
| Final Hawthorns Area Peak Parking Demand: | | 25-68 |

Source: Mead & Hunt, 2023.

5.2 Parking Supply Recommendation

With all factors mentioned above considered, the estimated peak parking demand for the Hawthorns Area is between 25 to 68 vehicles. Vehicle parking is not all that should be accommodated in the parking lot. Almost 20% of survey respondents indicating that they would access the Hawthorns Area by bicycle. Amenities for this group of visitors should also be included and this aligns with Midpen's goal of promoting visitor access by means other than personal automobile. Therefore, in addition to vehicle parking spaces, it is also recommended that bicycle parking in the amount of at least 15 spaces be incorporated into the parking lot design.

6. Existing Hawthorns Roadway Sight Lines

This chapter summarizes an evaluation for existing and potential driveway access points to the Hawthorns Area from Alpine Road and Los Trancos Road. Four locations along Alpine Road and two locations along Los Trancos Road were evaluated. Figure 53 shows the locations of all evaluated access points.

Description: Alpine Road is a two-lane roadway with no roadside parking. The posted speed limit is 35 mph. The roadway is lined with trees and part of the west side of the street has a steep embankment starting at the paved shoulder.

Los Trancos Road is a two-lane roadway with no roadside parking. The posted speed limit is 35 mph with an advisory speed of 25 mph in the northbound direction. The roadway makes an S-turn at the location of the two evaluated driveway locations. There are existing trees on both sides of the roadway; most are set back from the roadway and do not obstruct the roadway visibility.

The Alpine Road / Portola Road intersection is subject to all-way (three-way) STOP control. There are no existing traffic control devices or pedestrian crossings at the other evaluated intersections. A future driveway is assumed to require drivers to stop and yield to oncoming traffic.

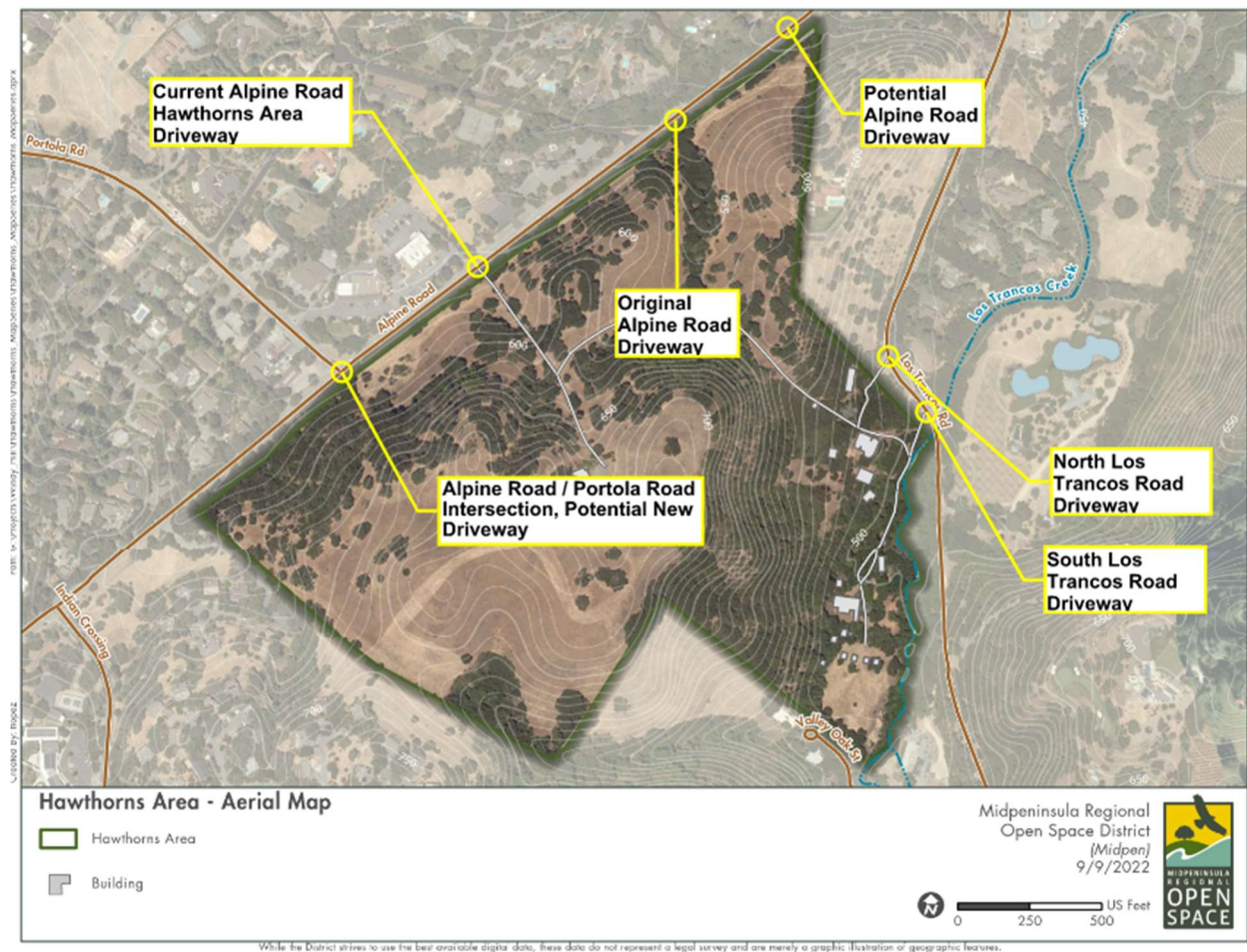


Figure 53 Hawthorns Area Potential Access Points

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Sight Distance Evaluation: Appendix A: Sight Distance Exhibits shows the available sight distances at each of the five evaluated driveway locations. Sight distances have been compared to criteria included in AASHTO’s A Policy on Geometric Design of Highways and Streets, 2018 7th Edition (Green Book).

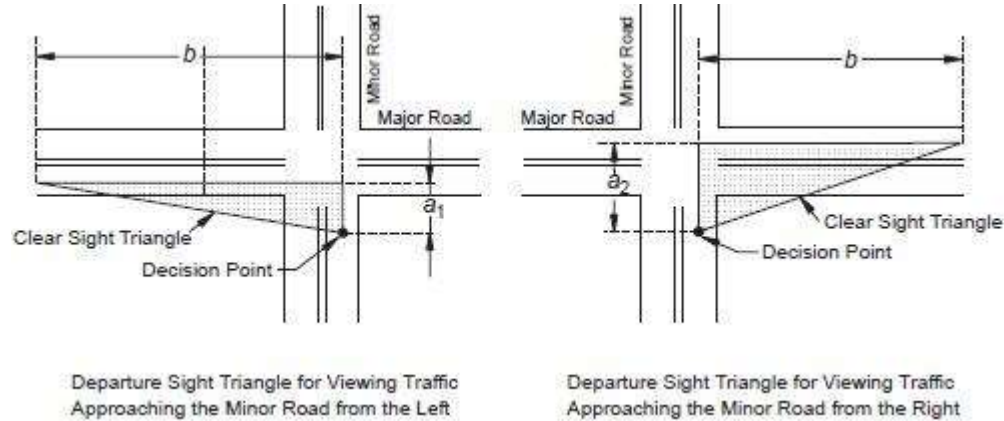


Figure 54 AASHTO Departure Sight Triangle Diagram
 Source AASHTO (2018)

Figure 54 shows the departure sight distance diagram for both left and right turns. The posted speed limits for these segments of roadway are based on engineering traffic and safety surveys (ET&S) prepared by the Town every five to seven years. Consistent with the [California Manual for Setting Speed Limits \(2020\)](#), “Speed limits set by E&TS are normally set near the 85th percentile speed. The 85th percentile speed is the speed at or below which 85 percent of the traffic is moving, and statistically represents one standard deviation above the average speed.”

The posted speed limit for the evaluated locations along both Alpine Road and Los Trancos Road is 35 mph. As such, the 85th percentile speed is assumed to be near 35 mph and below 45 mph. Required distances for left- and right-turn departures and stopping sight distances for design speeds of 35 mph and 45 mph are shown in Table 14 below. Grades of roadways are generally flat, so no adjustments to the required sight distances have been made due to the grade of either the major roadway or the potential driveways.

Table 14 Sight and Stopping Distance Requirements per AASHTO

| | Left Turn Sight Distance | Right Turn Sight Distance | Stopping Sight Distance |
|----------------------------|-----------------------------|------------------------------|----------------------------|
| Passenger Vehicle (35 mph) | 386 ft | 335 ft | 250 ft |
| Passenger Vehicle (45 mph) | 497 ft | 430 ft | 360 ft |

Source: Parametrix and Mead & Hunt, 2023

The estimated intersection sight distances at the evaluated driveway locations are shown in Table 15. Those distances are compared to the distance requirements in Table 14.

Table 15 Hawthorns Area Access Points, Intersection Sight Distance Summary

| Location | Approximate Intersection Sight Distance Left (Right) | Meets Corner Sight Distance Criteria? | Meets Stopping Sigh Distance Criteria? | Issue | Potential Mitigation |
|--|--|---------------------------------------|--|----------------------|----------------------|
| Current Alpine Road Driveway | 490' (590') | Yes | Yes | N/A | N/A |
| Original Alpine Road Driveway | 695' (570') | Yes | Yes | N/A | N/A |
| Potential Alpine Road Driveway (near Hillbrook Dr) | 440' (650') | Yes | Yes | N/A | N/A |
| Potential Alpine Road Driveway (at Portola Road) | 500' (600') | Yes | Yes | N/A | N/A |
| Los Trancos Road Driveway (North) | 265' (304') | No | Yes | Curvature of roadway | None |
| Los Trancos Road Driveway (South) | 140' (125') | No | No | Curvature of roadway | None |

Source: Mead & Hunt and Parametrix, 2023.

All four locations along Alpine Road have adequate sight distance for both left and right turns. Neither of the two driveway locations along Los Trancos Road provide adequate sight distance for either a right or left turn. The main reason for the inadequate sight distance is the curvature of Los Trancos Road at these locations. Remedying the deficient sight distance would require realignment of a portion of Los Trancos Road; it is expected that this would be prohibitively expensive and time consuming and thus not identified as a feasible mitigation.

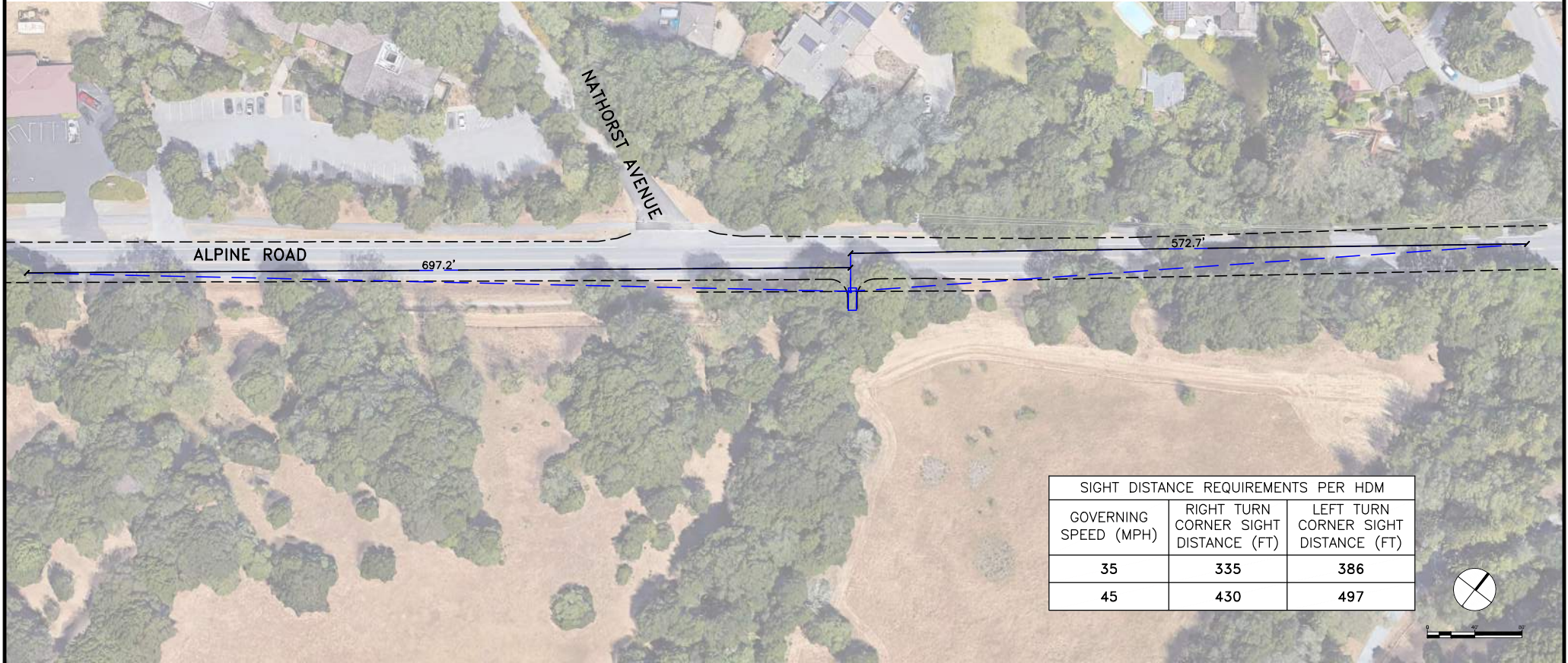
Recommendations: Based on the evaluation of the existing sight distance, it is recommended that any driveway entrance for general public access to the Hawthorns Area be located along Alpine Road. Any final design of the intersection should include analysis of any required adjustment to required stopping and intersection sight distances based on the grade of Alpine Road.

If an entrance is used for private entry, then it is recommended that hazards be mitigated by appropriate signage/markings.

Attachment 3

Hawthorns Area of Windy Hill Open Space Preserve
Transportation Study
Midpeninsula Regional Open Space District

Appendix A: Sight Distance Exhibits



PRELIMINARY
NOT FOR CONSTRUCTION



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800 Bancroft Way, Ste 203
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(510) 343-6400

DRAWN: VM CHECKED: AL
DESIGNED: VM APPROVED: AL

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT
HAWTHORNS AREA
ORIGINAL ALPINE ROAD DRIVEWAY

| REVISIONS | | DATE | SCALE |
|-----------|-------------|-----------------|---------------|
| NO. | DESCRIPTION | 12/23/2022 | 1" = 40' |
| | | FIG PROJECT NO. | 22036 |
| | | DRAWING | SD-2 |
| | | SHEET NO. | 2 OF 5 |



PRELIMINARY
NOT FOR CONSTRUCTION



Know what's below.
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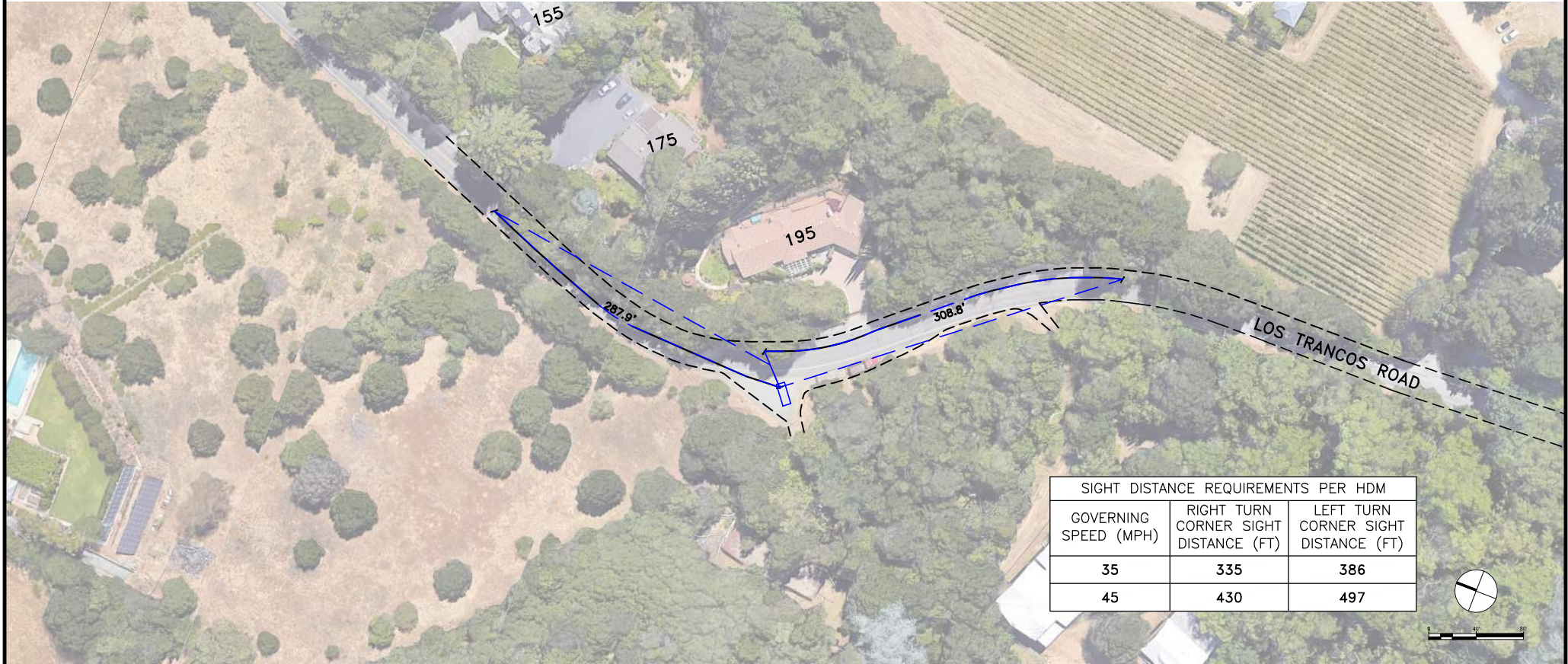
Parisi
TRANSPORTATION CONSULTING

800 Bancroft Way, Ste 203
Berkeley, CA 94710
(916) 343-6400

DRAWN: VM CHECKED: AL
DESIGNED: VM APPROVED: AL

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT
HAWTHORNS AREA
POTENTIAL ALPINE ROAD DRIVEWAY

| REVISIONS | | DATE | SCALE |
|-----------|-------------|-------------------|---------------|
| NO. | DESCRIPTION | 12/23/2022 | 1" = 40' |
| | | PROJECT NO. 22036 | |
| | | DRAWING | SD-3 |
| | | SHEET NO. | 3 OF 5 |



PRELIMINARY
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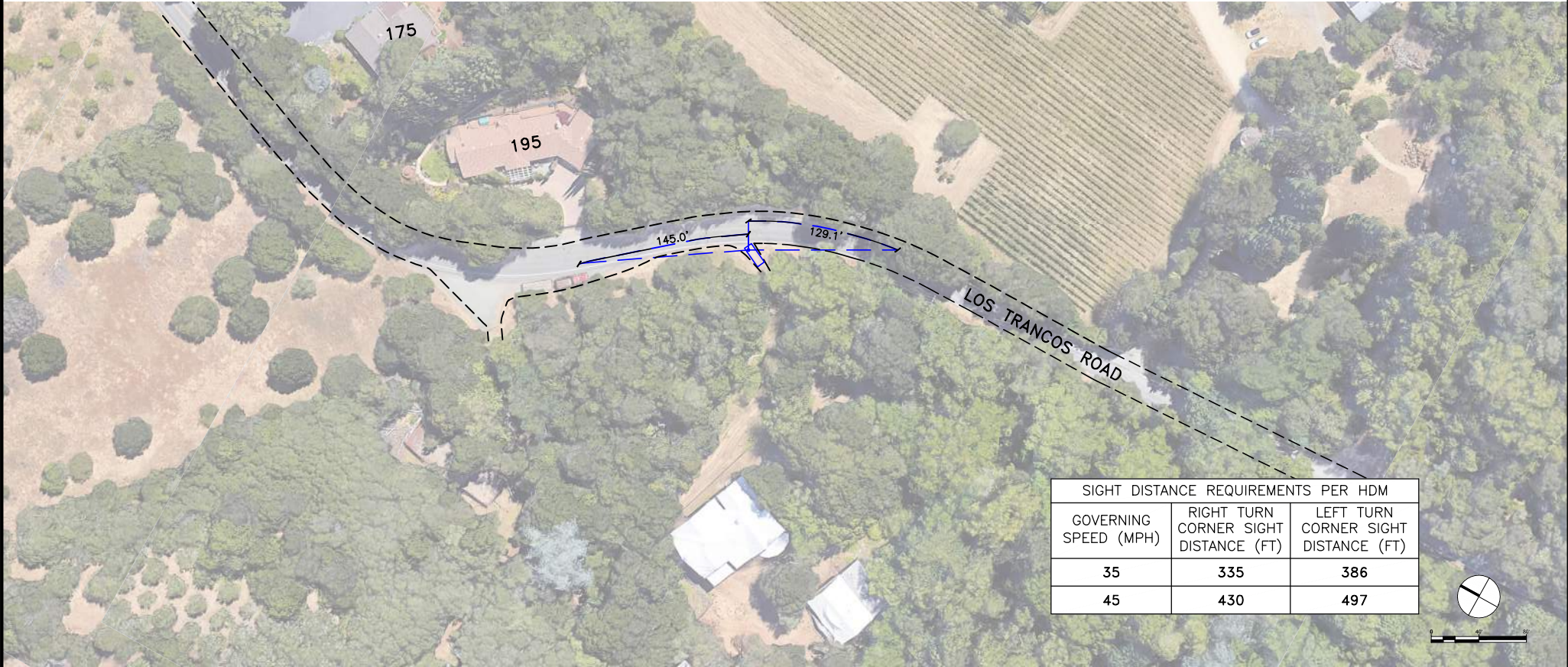
Parisi
TRANSPORTATION CONSULTING

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Berkeley, CA 94710
(510) 343-6400

| | |
|--------------|--------------|
| DRAWN: VM | CHECKED: AL |
| DESIGNED: VM | APPROVED: AL |

MIDPENINSULA OPEN SPACE DISTRICT
HAWTHORNS AREA
NORTH LOS TRANCOS ROAD DRIVEWAY

| REVISIONS | | DATE | SCALE |
|-----------|-------------|-------------------|---------------|
| NO. | DESCRIPTION | 12/23/2022 | 1" = 40' |
| | | PROJECT NO. 22036 | |
| | | DRAWING | SD-4 |
| | | SHEET NO. | 4 OF 5 |



PRELIMINARY
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Berkeley, CA 94710
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| | |
|--------------|--------------|
| DRAWN: VM | CHECKED: AL |
| DESIGNED: VM | APPROVED: AL |

MIDPENINSULA OPEN SPACE DISTRICT
HAWTHORNS AREA
SOUTH LOS TRANCOS ROAD DRIVEWAY

| REVISIONS | | DATE | SCALE |
|-----------|-------------|------------------------|---------------|
| NO. | DESCRIPTION | 12/23/2022 | 1" = 40' |
| | | FIG. PROJECT NO. 22036 | |
| | | DRAWING | SD-5 |
| | | SHEET NO. | 5 OF 5 |